

AVIATION WEEK

A McGRAW-HILL PUBLICATION

FEB. 1, 1954

50 CENTS

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FIRST TO QUALIFY UNDER NEW CAA LAB TEST FOR AIRLINE CERTIFICATION !

THE new-type Super Constellation 1049-C transport by Lockheed packs 13,000 horsepower, 133,000 pounds gross weight—but Goodyear wheels and brakes have proved themselves capable of handling the high torque and huge load *within the shortest stopping distance of any equipment tested.*

In so doing, Goodyear equipment becomes the first to qualify for commercial airline certification under the severe new CAA laboratory tests which call for far higher kinetic energy loading than that encountered in any flight-operating conditions.

The basic flexibility of the famed Goodyear Single Disc-Type Brake, coupled with its outstanding record of success in past performances on the nation's leading airliners,* make it the ideal design for meeting the requirements of today's new aircraft.

Other benefits are equally noteworthy: (1) ease of maintenance, (2) parts interchangeability which goes with standardizing on Goodyear equipment, (3) longer brake life with shorter stopping distances, and (4)—above all—dependability. Goodyear Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.



* Now being flown on: Douglas DC-7, DC-6, DC-4 aircraft; Convair 240 and 340 series; Martin 202's and 404's—as well as on other famed Lockheed Constellations.

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Super-Centaur, and the novel anti-icing radome in the nose, are products
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LINE OF NARCO PRODUCTS

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navigation for safer, easier, faster, more precise, more
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To implement this final link in CAA's enroute system
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Distance Measuring Equipment for commercial and
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Perfected after years of exhaustive development
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This first, new airframe tested DME, introduces Narco's
new *Sapphire* line of navigation and enroute systems—
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choose *NARCO* DME for
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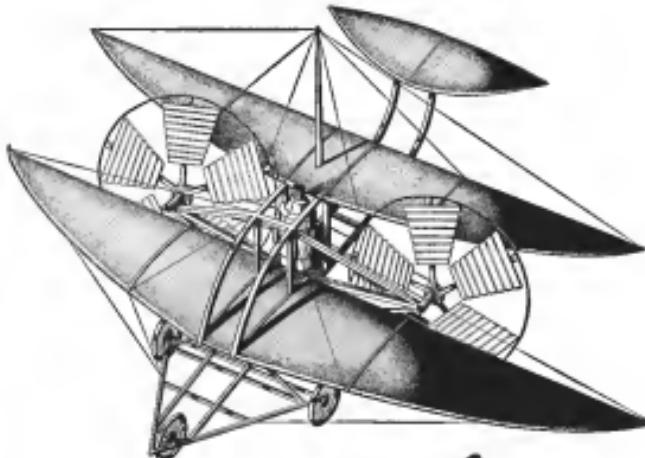


Weighing less than 20 pounds, Narco DME equipment consists of a
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Audubon, Pennsylvania



...out of this came Aviation

...a pencilsinn industry

To serve this great industry a manufacturer must maintain the best and most modern equipment available, operate it with skilled craftsmen, and use every existing method of tightening specifications and cutting production costs. Indiana Gear is such a manufacturer—a company of craftsmen producing fine quality transmissions and actuators for industry.



This is the control panel room in I.G.W.'s new modern flight testing department—site of the continuing efforts to develop Gears' unique ability to create hand-to-eye links for aircraft spectators.



INDIANA GEAR

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Domestic

Northrop Aircraft has set up a weapons systems analysis department at its Hawthorne (Calif.) plant to match elements "in the best possible manner," predict effectiveness and capabilities and offer suggestions on military use. Director of the new department: Herbert K. Weiss, former chief of Army's weapons systems laboratory at the Aberdeen, Md., proving ground.

Deadline for military contractors on CAR's proposed concession of speed and distance requirements to leases and leasing rules has been extended to Feb. 1. Elimination of rules per lease and statute rules was initiated by Air Transport Assn. and Air Line Pilots Assn., representing more than 95% of all airway traffic under instrument flight rules.

Northeast Airlines has bought four Convair 240s from Pan American World Airways plane to use the transoceanic transoceanic to Alaska service on New Zealand routes this spring. Pricing on each: \$24, 510,000.

DC-4 flight simulators, developed by Transocean Air Lines, has been certified by CAA.

California Eastern Airlines has agreed approximately 90 flight crews to handle its new two-month Pacific air lift contract, expects to continue operation after the contract expires Mar. 31 if several options are negotiated successfully. The company plans to maintain all of flight equipment and at Oakland, Calif., maintenance base after USAF turned down CEA's bid last but last November.

Eduard A. Link, board chairman of Link Aviation, has established the Link Foundation at Binghamton, N. Y., to advance training and education in aeronautics.

Bell Aircraft Corp. has sold three Model 47G helicopters to the Spanish army, believed to be the first rotary wing aircraft purchased by that country. Bell will train three Spanish pilots and mechanics this month at Ft. Worth, expects to deliver the copilot at Madrid in March.

Lufthansa has ordered 477 aircraft valued at \$649,875, despite 1953, compared with 154 at \$3,940,729 the previous year, Aircraft Industries Assn. reports. Domestic deliveries totalled 41 planes valued at \$554,778.



Grumman Cougars Prowl the Skies

First picture of a formation of surprise Grumman Cougars to be released by the Navy shows four Allison-powered FWF 5 over Virginia. The Cougar is the first supersonic jet fighter in production service with the Navy. Sixty ships, planned by PWPA 145, are designated FWF-5. The Cougar, rated as the superior, has earned all due attention. Some models are used for high-speed photo reconnaissance.

Charles H. Goben, Jr., 35, vice president and treasurer of Aircraft Supplies, died Jan. 23 at Natick, N. J.

N. W. Bowley, 46, assistant chief engineer of Convair's San Diego Division, died last week.

Ahmed H. Wessel, 70, retired CAA director engineer at New Bedford, Pa., was killed last week when a motorized glider in which he was being taught to New York following a stroke crashed near San Diego. Two others died in the accident.

Charles E. Willis, Jr., aviation aide to Presidential assistant Russell Adams, has married Elizabeth Frontiere, daughter of Harvey Frontiere, director of Harvey Frontiere, Jr.

Financial

Ryan Aeronautical Co., San Diego, has declared a regular quarterly dividend of 10 cents per share on common capital stock, payable Mar. 12 to stockholders of record Feb. 15.

International

Polar Air route has been explored for the third time in more than a year by

Scandinavian Airlines System, flying the last of its 14-plane DC-8 fleet from Los Angeles to Stockholm. SAS president Toru H. Nilson says the carrier now is in a position to begin commercial flights over the proposed 6,900-mi route May 1 if Scandinavian wins commercial permits in negotiations with the U. S. and Canada.

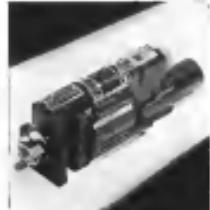
Swissair DC-8 has flown the 501-mi, London-Zürich route in a record 55 min., clipping 5 min. of the previous best time of 49 min. The aircraft had taken off about 10 min. early. The record flight was set by 7-4-4 of Swissair's Convair 240 fleet at 12,000 ft. (See Aviation Week Oct. 12, p. 110).

Canada's aircraft industry delivered nearly 2,000 military planes to U. S., British and Canadian forces last year at a cost of approximately \$100 million, Air Industries and Transport Assn. report. Contracts received more than \$12 billion in orders from Department of Defense Production for aircraft parts, equipment and overload work.

Poland's Intermetall will receive its first aircraft—a Super Constellation, at Lockheed Aircraft Corp.'s Burbank, Calif., plant. Feb. 1 Polak's U. S. ambassador will take delivery on behalf of the new airline.

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has been around
(and still is!)



Trim-Trol was developed in 1947 to activate trim tabs on the prototype Grumman Albatross. This aircraft proved so rugged on the new amphibious, reinforced perfectly despite prolonged exposure to salt water. Soon afterwards, McDonnell selected Trim-Trol for the original Banshee. It has been used in every model of the series.

The same basic model continues to satisfy all demands, although aircraft designs have changed radically. Trim-Trol is now specified equipment in the Convair Corsair, the Douglas Skymaster and A3D.

Meeting the requirements of MIL-A-3854 (USAF), it weighs 315 lb., has ultimate static capacity of 2000 lb. in., and produces 360 lb. in operating torque through 260 degrees.

The story of Trim-Trol is only one example of Airborne's pioneering in the avionics field. As the evolution of aircraft design poses new problems, look to Airborne for the solutions. For more information on Trim-Trol and other avionics, see our literature in the TAB Catalog.

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The Aviation Week

February 1, 1954

Headline News

Army Buys More Hold Free Dies
NASA Adds 1000 Miles to Gemini
Gulfstream Not Expected to Fight CAS
Lockheed Reverses Planes Award
Defense Act in Security Hand
Institutes Class of Advanced Engineers
Faster Speeds in Radio Conference
CIA Adds 1000, LHS Grows
Custer F-104
Learjet Wins NASA Order
Convair 338 Proves Best 1000
India Gives Name to U.S. Air Force
Cred Test Vought Expands Models
Navy Test Vought Expands Models

Aeronautical Engineering

Aerospace Probes Upper-Air Profiles

Production

How to Get and Hold Your Engineers

Airavics

New Jobs for Digital Computers

Financial

Aircraft Stocks Make New Gains

Equipment

Deuter Gas Fueled Light System

Air Transport

P.D. 446 Since Then in Mid-Term

ATAV Joins in Airlift Recovery

DEI Flights Recovery Overdue

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the ARC Portable COMMUNICATOR

TYPE 12
VHF 120-144 mc

Here's the answer to a need of both military and civilian aircraft and other industries as well — a two-way VHF radio communication set that is easily portable, requiring only the addition of a 24 volt dc power source. Both transmitter and receiver are contained in a sturdy carrying case, weighing only 37 lb. With omnidirectional antenna, it can be an up-grade anywhere.

Principal uses are for ground or shipboard communication and can be a valuable addition to any flying program for either ground-to-plane, air-ground-to-ground communication over rough terrain.

The maximum amount of the p-19 VHF Receiver and a choice of the T-118 or T-118A VHF Transmitter — either for Army, Navy and Air Force — depends on 30 to 100 miles, with strength at 2800 to 30000 feet and ground range at 30 feet.

Size of case is 18½ by 10½ by 8½ inches. Landspeaker and/or handset. Write for complete details.

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BELL DELIVERS FIRST HSL—Navy Bell HSL-1 has flown 700 mi. from Ft. Worth, Tex., to Eglin AFB, Fla., for extensive climatic tests. First view of the big cockpit door simultaneously shows craft (right) fitted with vented lid.

New Aircraft Start Tests



FRENCH TEST NEW RESEARCH PLANE—Avenger 1402 Goring, which made its first flight Jan. 18, is new delta flying butt, highly loaded wing. Weighing approximately 6,000 lb., the 1402 is powered by a 670-lb thrust Atar 10IC and free turbine.



S.2.5 ENTERS NEW TEST PHASE—Short Rov carrying research plane now is flying with horizontal tail mounted below fuselage. Previously it had been placed atop the fin. Note ground-adjustable leading edge wing cambers adjacent to the fuselage.



4 major developments in TEMCO's rapid growth



PRODUCTION — TEMCO's early built a reputation for certain production of high quality, on schedule, at lowest possible cost. In its Dallas and Greenville plants, TEMCO is producing major components for Martin, Lockheed, Consolidated, Beech, McDonnell and Boeing. One current assignment is Boeing B-47 Strategic bomber assemblies, shown above.



OVERHAUL — Another major TEMCO activity has been aircraft overhauled and modification for the armed services. Today, assembly-line rehabilitation of multi-engine aircraft is an important, growing service both at the Dallas and Greenville plants. A current project at the Greenville plant is the Air Force C-97 Hospital Ship conversion, illustrated above.



BASIC DESIGN — In recent years, TEMCO has placed additional emphasis on new design of its own. New military aircraft such as the Model 33 PUEBLO invader, illustrated above, now being evaluated by the U. S. Navy at Pensacola, Florida, are evidence of the company's development ability.



RESEARCH AND DEVELOPMENT — TEMCO's expanded engineering staff is working on many new military aircraft projects of advanced scope. Modern facilities, such as the well-equipped engineering research laboratory above, help TEMCO designers solve complex military aircraft design problems.



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WHO'S WHERE

In the Front Office

• **James Geddes**, Ammator to the Secretary of the Air Force, has assumed his board chairmanship of the Hydrogen Peroxide Board, Defense Science Board, from his previous responsibilities. **Harry Oderwald** has been elected to succeed Geddes as chair man and **Albert E. Aker** is new president. Other changes: **E. S. Marston**, secretary treasurer; **James G. Clegg**, director of **Rockwell International** and pilot for **Lockheed Aircraft Corp.** and **Boeing Airplane Co.** has become a vice-president for **Thiokol Rocket Propulsion Co.**, San Francisco, Calif.

• **B. Gandy** has been appointed vice-president general manager of **Alfred V. Vargas**'s **Aerojet Engineering Division**, South Niskayuna, Conn.

• **Robert E. Baker** is new director of **Transportation for Loser**.

Changes

• **Bernard H. Bousfield**, former assistant publisher of **Science and Technical** magazine, was president of the Institute of the Americas, however, has been appointed general manager of **Applied Hydraulics** for **Industrial Publishers Inc.**, Cleveland.

• **Frank J. Marks**, just appointed manager of research and development at **US Air Transport Assn.**, Rose Adas, Calif., and **Robert L. Bader**, Naval Aviation research physicist, are now co-managers of development for **General Tire & Rubber Co.**, Akron.

• **S. R. Ross** has been promoted to chief maintenance engineer at **Lockheed**. Other appointments: **J. A. Thomas**, director of parts and services for the **Coldfront Division**; **A. F. Fabris**, chief test engineer; **H. D. Schlesinger**, **Parrot** C-900 units.

• **Louis J. Gross** is new public relations director for **Pan American Grace Airways**, nephew **Reddit A. Patterson**.

• **Frederick B. Schaefer** has been appointed associate chief engineer for **Canadian National Railways**. **J. M. Schaefer**, chief design engineer; **R. D. Boklund**, chief development engineer; **F. J. Kagnoff**, chief structures engineer; **F. J. Weller**, chief test and process engineer; **E. B. Higgin**, chief project engineer; **A. Harris**, project engineer; **H. H. Williams**, assistant process engineer; and **S. T. Pape**, section chief for assemblies.

• **Joseph J. Sherk** is new manager of **optical instruments** for **American Airlines**.

• **Walter J. Curtis, Jr.**, has become chief of research and development for **Miller Metal Products**, Engineering Research Division, Baltimore.

Honors and Elections

• **Dr. Irvin A. Goldberg**, vice president of engineering and research for **Kodak Manufacturing Co.**, Washington, D. C., has been appointed chairman of the **Electronics and Communications Panel** of USAF's Scientific Advisory Board. (Continued on page 54)

INDUSTRY OBSERVER

• Defense Secretary Charles E. Wilson reports that, with a "few exceptions," the aircraft industry has done a good job in meeting its aircraft delivery schedules during 1953.

• Test pilots who have flown the Convair YF-102 delta-wing, all weather interceptor at Edwards AFB report it has "exceedingly good" stability and control characteristics up to Mach .96, the maximum speed needed so far despite previous reports of stability problems associated with the plane. USAF chase pilots observing the YF-102 flights from a B-57 concert in the visibility and control aspects of Convair pilots. See **Shannon** and **Thirkell** below.

• **North American Electronics Division** of the **American Car and Foundry Co.** is believed to be planning expansion of a **Navar** "Project Tukabati" type atomic battery for producing micro and electronic components. Director of the new ACT operation is **James Alexander**, Vice, II, Electronics Division that developed Tukabati.

• **Bell Aircraft Corp.** board chairman **Lucy Bell** published a **Aviation Week** story on the difficulties encountered by **Mag. Charles Yeager** in his record Mach .98 flight in the **Bell X-1** (Aviation Week Dec. 28, 1953, p. 151). Bell and Yeager cut his power during the descent from over 70,000 ft. and because of the rammed air pressure but no control of the X-1 without power. Bell and the X-1 had to land forward and sideways for several thousand feet before responding to the controls. Yeager was knocked unconscious at the cockpit and his helmeted head smashed the inner glass of the double sealed cockpit canopy, according to Bell.

• **Rutan's** new million-dollar contract for rocket engines will provide power for the **Army's** **Chaparral** E surface-to-surface hominghead missile now being built by **Firestone**, **Rehber**, Co.

• **Pritz & Whitney** aircraft engines were powering 80% of the U. S. domestic commercial fleet at the end of 1953. More than 3,200 engines are installed in airline planes, a gain of 100 over 1952.

• **Avi-Fair** expects to sign a firm contract with **Pan American Airways** and **Edsel Corporation** of **America** this week for operation of the guided missile test range in the Caribbean. Negotiations were begun last summer but have been stalled at the Defense Department level. In the interim, missile test program has been seriously retarded by lack of adequate facilities to run the down range, destratifying instruments.

• **USAF** has a powerplant development program aimed at bringing along the big turboprop engines to succeed the **Pritz & Whitney** JT3, **Allison**, **Carolina**, **Wright**, **General Electric** and **Pratt & Whitney** are well along on programs aimed at producing 50,000 ft. thrust with afterburners.

• **Convair** expects to fly its first **Allison T56** powered **Convair** **Lancer** early this spring, probably in May.

• **American Airlines** has been testing a new aid warning device on a **Convair** **Lancer**. The system, developed in cooperation with **Goodrich** **Tox & Robber Co.**, lights up warning signals in the cockpit to alert pilot and co-pilot that a stall is under way. As engineers are one of the main advantages of this type of device is that it allows the pilot to keep complete control over plane's banking posture. The test installation has helped show planes can fly in their landing technique.

• **Jensius Aircraft Engine Co.**'s Model 104 helicopter currently is undergoing ground and flight tests necessary for **CAA** approval. **Coast** has soft swept-wing and pusher propeller landing with antitorque rotor to improve forward flight performance. First flight was last October.

• **North American** **F-100A** will have modified vertical tail featuring shorter rudder of increased chord. Base of tail is notched above leading upper edge. Original tail design of the **YF-102** had tall, unnotched, roughly design.

Air Buildup to Continue at Present Level

- Proposed fiscal '55 budget assures aircraft industry of peak production rate through next two years.
- Actual spending will increase to more than \$9 billion annually; backlog in '56 expected to total \$17 billion.

By Robert Bots

The aircraft manufacturing industry can look forward to at least another two years of business at its current level. This is the significance of the upturn portions of the fiscal 1955 federal budget just now before Congress.

Expenditures for military aircraft and related procurement are the key to current business levels, while state appropriations are the guide to future production levels.

► **Finance-Scheduled**—Top Defense Department spokesman says expenditures for aircraft, guided missiles and related readiness items are scheduled to increase during fiscal 1955 to \$9.1 billion and hold at \$9.1 billion for fiscal 1955. Of these totals \$4.4 billion will be spent on aircraft alone during fiscal 1954 and \$3.5 billion during fiscal 1955. This compares with \$7.4 billion spent on aircraft in the fiscal 1953 and \$4.4 billion in fiscal 1952.

Production of military aircraft will continue at its current rate of 900,000 per aircraft model year in 1956, but average weight will continue to increase during 1954 at a larger volume of losses transports and jet bombers delivered. Airframe weight will dip slightly during fiscal 1955 but return higher than in fiscal 1953.

► **\$20-Billion Backlog**—The aircraft industry is scheduled to enter fiscal 1956 with a backlog of \$17 billion in unfunded orders representing about 20,000 undelivered aircraft. This is a significant amount of current backlog of about \$12 billion.

For the future beyond 1956 the fiscal 1953 budget gives a rough idea of where the aircraft industry will stand after passing over the post-Korean hump. New appropriations of \$4.7 billion have been requested for aircraft and related procurement to which must be added approximately \$1.8 billion available in unutilized Air Force government

of the current fiscal year to \$5,540 at the end of fiscal 1955.

This includes an increase of USAP aircraft inventory from 21,000 planes to 22,000 during fiscal 1955, with about 36,000 aircraft in the Air Force, a 10 percent increase in the Navy, return to inventory from 13,130 planes to 12,800 planes for the same period. Number of Navy planes assigned to active duty will remain at 9,910. Marine air strength will remain at these levels, included in the total of Navy aircraft.

► **Air Force Expenditures**—USAF expenditure will reach a total of 115 fully equipped combat wings at the end of fiscal 1954 and 120 fully equipped wings at the end of fiscal 1955. Target for achieving the 115 wings will be the end of 1957.

No new procurement requests were made for Army aircraft or guided missiles during the fiscal 1954. An increase of 510 planes is anticipated during fiscal 1955. This comes with \$1.2 billion contracted for in fiscal 1955. Thus it appears that early aircraft procurement eventually will settle down in a \$5 billion annual level, which is about half of the post-Korean production peak and more than three times the level of the pre-Korean procurement level of fiscal 1950.

While the total inventory of military aircraft is scheduled to increase from 33,000 to 48,000 during the same time, the other inventory is scheduled to rise from 14,200 planes at the end

of the current fiscal year to 35,540 at the end of fiscal 1955.

This includes an increase of USAP aircraft inventory from 21,000 planes to 22,000 during fiscal 1955, with about 36,000 aircraft in the Air Force, a 10 percent increase in the Navy, return to inventory from 13,130 planes to 12,800 planes for the same period. Number of Navy planes assigned to active duty will remain at 9,910. Marine air strength will remain at these levels, included in the total of Navy aircraft.

► **Army Expenditures**—USAF expenditure will reach a total of 115 fully equipped combat wings at the end of

leads to be carried over from fiscal 1955.

This will provide a total of 36.5 billion for new aircraft contracts during fiscal 1955. Since all funds required for the Air Force expansion to 115 wings have been appropriated in prior years, the fiscal 1955 procurement request is pretty close to the maximum and administration has requested to keep USAF and Navy aircraft at their authorized maximum levels.

► **Marine Aircraft**—Total of 87.7 billions is scheduled to be consumed in aircraft procurement by USMC and Navy during fiscal 1954. This compares with \$1.2 billion contracted for in fiscal 1955. Thus it appears that early aircraft procurement eventually will settle down in a \$5 billion annual level, which is about half of the post-Korean production peak and more than three times the level of the pre-Korean procurement level of fiscal 1950.

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Military Aircraft Expenditures

	Fiscal 1953	Fiscal 1954	Fiscal 1955
USAF		100,000 (estimated)	
Navy	55,365	58,900	56,700
Total	1,715	7,400	3,490
Total	57,321	59,300	56,390

New Aircraft Contracts

	Fiscal 1953	Fiscal 1954	Fiscal 1955
USAF	58,195	55,570	54,527
Navy	3,115	1,860	1,980
Total	512,421	57,730	56,997

Backlog of Unexpended Funds

	Fiscal 1953	Fiscal 1954	Fiscal 1955
USAF	\$16,568	\$13,970	\$12,217
Navy	4,847	4,250	5,387
Total	525,415	59,220	587,804
Source: Federal Budget			

NACA Research Program

The following table shows funds expended by the National Advisory Committee for Aeronautics in fiscal 1953 and 1954 and the amount of new money requested for 1955.

Purpose	1953	1954	1955
Aeronautics research	\$24,205	\$25,604	\$25,283
Propulsion research	15,126	15,419	15,703
Aerospace structural research	5,061	6,778	5,135
Operations problems research	5,231	5,297	5,983
Ground/aeronautics equipment	3,167	1,346	7,829
Total	540,036	550,009	555,000

NACA Asks \$53.6 Million for '55

National Advisory Committee for Aeronautics has requested a \$53.6-million budget increase for fiscal 1955 over the current year.

Half of the increased funds requested is for expanded research and aircraft characteristics of high-speed aircraft. • A new flight facility at Lewis (Ohio) Laboratory.

• Allotments to an existing windtunnel at Lewis Laboratory to increase its speed range.

• Allotments to two existing windtunnels for engine research facilities at Lewis

and Ames (Calif.) Laboratory to increase high-speed capabilities.

• A new flight facility at Langley (Va.) Laboratory for research on landing and takeoff characteristics of high-speed aircraft.

• Rocket engine test facility at Lewis (Ohio) Laboratory.

• Allotments to an existing windtunnel at Ames Laboratory to increase its speed range.

• Additional windtunnel equipment for engine research facilities at Lewis

and Ames aircraft and the aircraft's capability to land at a constant airspeed.

• Did not have the proper modified facilities to fly the aircraft.

• Flew the transport in a "tandem manner."

CAA asked that Godfrey's pilot certificate be suspended. "For such period as the Board deems necessary in the public interest" and not until he receives a CAA medical certificate.

► **Godfrey**—Godfrey claims he was caught in a "moment of heat" and was unable to make his flight. "I was not able to make my flight because this was the first time I had to make a transatlantic flight in about 10 years and make new schedules. They have come a lot closer to meeting their schedules this year."

Godfrey was taking off in a still crosswind blowing from the direction of the power plant when he was caught. AVIATION WEEK is told: "Most of the DC-3s were built quickly, a normal technique, but was damaged suddenly when it was caught in the crosswind. After the plane left the ground, it headed for the runway, but was unable to stop, which caused an immediate takeoff, which is a serious mistake for a pilot, rather than a problem with a crosswind.

Godfrey's DC-3 was modified late last year to take PAAWA R2000 engines of 1,150 horsepower. It normally has four Pratt & Whitney R2000-15s with 1,200-hp 707WA R2000-15s. It is the first privately owned DC-3 to have R2000s installed.

► **Certified Technically**—CAA's charge

that he did not have the proper mesh cell corduroy appears to be a technicality. The agency has no record of Gielb's "misled" classification since 1949. The law requires that classified testimony be held with two years.

Goldberg, who is a former Navy physical inspector, has the proper government security clearances to see the CAA. Since the Totskobus accident, CAA has received a special exemption to grant letters of New York doctor made on Godfrey Dec. 15. If accepted, that would probably would cause the required change to be dropped automatically.

Lindbergh Receives Pioneer Flight Award

"Long term survival depends alone on the character of man," Charles A. Lindbergh told the 12th Annual Human Needs Banquet of the Institute of the Americas in Seattle last week.

Lindbergh, making a rare public appearance, philosophical on aviation in its modern environment. He said the "old" earlier liaison with the art of flight has transformed into a responsibility for the welfare of mankind and the security of our American people. "The modernity of man now stands on amazing accomplishments but faces serious problems."

► **IAS Award**—Lindbergh received the Daniel Guggenheim Medal, awarded annually by representation of three aeronautical societies, for "pioneering in flight and navigation."

Other winners were during the Human Needs meeting (AVIATION Week Jan. 25, p. 10) to Capt. C. F. Gell, (MC) USAF; Henry T. Harwood, Jr., United Air Lines; Ernest G. Strotz, Conair, and Dr. Donald G. Cole, California Institute of Technology.

► **Fellowship—Honors**—Fellowships were presented to Fletcher Bessell, president of Spruce Aerospace Co., and Mr. William Fawcett, assistant director of A. V. Roe and Co., Ltd.

Fellowships for 1953: Mr. Bryan G. Brammer, president, Australian Aerospace, Ltd.; F. P. Cheshire, chief of aerodynamics for Aerostatic Research Ltd., Australia; Capt. N. Dickerzon, chief engineer of GKNV Wright Aircraft; E. M. Fawcett, vice-president-engineering at GKNV Wright Corp., Peter W. Frost, chief engineer of M&WA Division of United Aircraft; Norbert E. Howey, technical director of Blackburn & Gimson Aircraft, Ltd., England; Maurice P. Rev, director of Oceania, France; K. E. Sutcliffe, professor of aerodynamics, California Institute of Technology; E. C. Wicks, vice-president-engineering, Boeing Airplane Co.; Charles Wood, chief palleyware design engineer, Santa Monica plant, Douglas Aircraft Co., Inc.

Defense Acts in Security Hassle

Seaton recommends Navy censorship changes; USAF spells out new classification responsibilities.

Recommendations to change censorship provisions of Navy's new security directive (AVIATION Week Jan. 18, p. 17, Jan. 25, p. 15) were transmitted last week by Assistant Defense Secretary Fred A. Seaton to Navy Secretary Robert B. Anderson.

Meanwhile, the Air Force issued a regulation (385-95) defining policies and procedures for assignment and declassification of security classification to USAF personnel and aircraft engines.

State the States' recommendations on Navy security cases from Department of Defense level to a subordinate unit, adoption appears certain.

► **Defense Policy-Directed Security**—Directive of Defense's Office of Public Information, declined to send specific details of the changes recommended, but said "they will bring the Bureau of Aerospace instructions in line with Defense Department policies."

Defense officials were unable to estimate when the revised directive will be issued to Navy contractors and field installations.

Under USAF's new regulation, which supersedes AFPS 385-24 and 385-26, Air Research and Development Command is specified as responsible for the security of all items throughout the supply chain, adoption appears certain.

period during which the vehicle is being designed and the initial quantity of test items is being produced and delivered.

► **Air Materiel Command**—Complaints taken over classification authority after a decision is made to produce the article or quantity for inventory purposes and the development period are still under way. AFPS 385-95—The classification changes apply to USAF personnel assigned to aircraft aircraft special research aircraft, aircraft engines and guided aircraft rockets. The chart does not apply to rotary wing, training, liaison, search and rescue, cargo and glider types of aircraft. Initial security classification of these aircraft shall be made by Headquarters USAF, upon recommendation of the command having security in theory.

Revisions will not be permitted when to new or newly modified aircraft or aircraft engines or subassemblies concerning them in anticipation of the aircraft or engine being used in a test, initial release of information, or to make cuts upon the approval of the Office of Public Information, Office of the Secretary of the Air Force, Headquarters USAF, or when made with the Office of the Secretary of Defense.

► **Security Phases**—There are four basic phases of development and production for aircraft:

- 1. Preliminary design studies and Phase 1 contracts through mockup.
- 2. Phase 2 contracts from mockup until fighter roll-out of the first production aircraft.
- 3. Early roll-out and operational analysis.
- 4. After operational tests are complete production aircraft.

Similarly, there are four basic phases of development and production for aircraft engines:

- 1. During design, including drafting of specifications and preparation of drawings and data.
- 2. Date of completion of first "X" engine for initial full-scale testing.
- 3. Date of acceptance of 50th qualification test or equivalent.
- 4. Date of acceptance of 150th qualification test or equivalent.

Lufthansa Misses First 340 Delivery

Lufthansa, the proposed German airline, missed delivery of its first Convair 340 last week because the federal inspection board's boarders has not yet settled the Airtel price treaty. The engine was built in Union Carbide and Carbon Corp.

The airline has four 340s on order, but until the treaty has been ratified by both, it cannot operate aircraft.

BuAer Security Result: Confusion

Aircraft industry says directive indicates haphazard classification, multiplies paper work and expense.

Los Angeles—U.S. Navy's latest directive on security classification was issued as much confusion in the aircraft industry last week that some industry officials feared it might undermine the security structure.

In addition to its attack on press freedom (AVIATION Week Jan. 18, p. 15), Bureau of Aeronautics Instruction 0510.19 also outlined the Navy's new rules for handling of classified information.

► **Information Upgrades**—Following President Eisenhower's order slanting the security classification of Restricted, extremely upgrading of information to Confidential by both Air Force and Navy was reported by industry sources.

"It's a boon to the struggling aircraft industry," said one official. "Large numbers of documents which we previously handled as Restricted material now may be handled as Confidential."

► **Early Steps**—While the President's order was issued at greater discretion of information, industry officials reported only a comparatively small amount of Restricted material now was being classified.

It appeared that more aircraft officials were willing to take the responsibility of reviewing the Restricted label on information, were taking the easier step of upgrading it.

The result has been to expand the Confidential classification to cover both of the former categories of Confidential and Restricted, said an executive who is responsible for handling of classified information at one of the nation's largest aircraft plants.

In addition, the addition of the new Navy directive places an classified information have the effect of creating two parallel security systems.

► **Contractor Complaint**—One subcontractor reported the expense and confusion had been compounded by a Navy ruling that all persons who handled documents under Restricted now must be advised that they had been assigned to Confidential, if such were the case.

"It's warped with the paperwork," he asserted.

The danger of mass over-classification of information was pointed out by one official, who commented: "There is no better way to bring about a series of security violations than to try to implement the security classification haphazardly at the whim of the unit manager. Over-classification does just that."

► **Security Phases**—In addition to en-

hancing the new security classification as Secret, Confidential and Unclassified, the Navy directive listed a variety of what it termed "secret phases" to guide the industry in its handling of classified information.

Then, the Confidential classification was broken up into five "phases":

1. **Secret Phase 1**—Solely owned or controlled information, including codes and cryptos, in this early security phase is classified Secret. Information may be disclosed after review, if it does not disclose existence of the project.

2. **Secret Phase 2**—Since in Secret Phase 1, except that most of the information concerning equipment and projects in this phase is classified Confidential.

3. **Secret Phase 3**—Since in Secret Phase 3, except that most of the information concerning equipment and projects in this phase is classified Confidential.

4. **Secret Phase 4**—In this phase, the need to control the existence of projects or equipment as highly sensitive projects and cryptos is eliminated by means of more significant information protection at the Confidential level.

The following list indicates the general scope and type of classified information:

(1) Model designation or other brief identification of the equipment or project.

(2) The contractor may be identified as holding a fixed contract. The total dollar value of the contract may be announced.

(3) A very limited statement that discloses the general purpose of the equipment or project.

(4) **Security Phase 5**—The external appearance of equipment and its benefits and other significant features.

Unclassified projects, lateral workings of the equipment or fundamental principles involved are not thereby disclosed.

The following types of data may be disclosed subject to strict review by OPI (Office of Public Information, Department of Defense):

(1) External photographs of a general nature that do not reveal classified equipment or other classified details.

(2) Somewhat more liberal statement regarding the purpose of the equipment or project.

(3) Public display of equipment in open, unfenced, paved areas provided classified equipment or classified aircraft are removed or covered during the display. Each such display, including subsequent uses of the same

Classification Chart of USAF Aircraft and Engines

Basic of Information

Model designation and manufacturer, and original model or manufacturer. General supporting data information. Physical characteristics including design, gross weight. Performance in general. Effect performance and characteristics. External photographs, drawings, dinner, nose, nacelle and molding including hardware. Internal photos and drawings. Assembly details which cannot be made available without revealing the construction. Control and guidance details. Launching details. Transition details. Windshield data.

Category 1

Model aircraft or aircraft engines of new design

(Phase of development) and production

1	2	3	4	1	2	3	4
O	U	U	U	O	U	U	U
C	O	O	O	C	U	U	U
S	O	O	O	S	U*	U	U
S	S	C	C	S	S	C	C
C	O	O	O	C	C	C	C
S	S	C	C	S	S	C	C
S	S	C	C	S	S	C	C

Category 2

Modified version of existing aircraft or engines with significant changes in design and performance

(Phase of development) and production

1	2	3	4	1	2	3	4
O	C	O	O	O	C	O	O
C	C	O	O	C	C	O	O
S	S	O	O	S	S	O	O
S	S	C	C	S	S	C	C
C	C	C	C	C	C	C	C
S	S	C	C	S	S	C	C
S	S	C	C	S	S	C	C

Basic of Information

Model designation and manufacturer. Type of aircraft, dimensions and power. External photos and drawings. External photos and drawings. Engineering design information.

1	2	3	4	1	2	3	4
O	C	O	O	O	C	O	O
C	C	O	O	C	C	O	O
S	S	O	O	S	S	O	O
S	S	C	C	S	S	C	C
C	C	C	C	C	C	C	C
S	S	C	C	S	S	C	C
S	S	C	C	S	S	C	C

*Discouraged to Unclassified until upon approval of DOD, USAF. Based upon recommendations submitted for the aerospace major air commands.

component, regular specific authorizations from the Bureau of Aircraftmen.

(D) Limited statement regarding performance. (No numerical data, only generally descriptive statement.)

e. **Safety Phase C4.** Contains other information as documented as this addition to the foregoing, the following is eligible for release to the public after review and approval by CPO:

(1) Artistic and advertisements describing general features of equipment and projects.

(2) Such performance and technical data as any current the public but cannot be furnished by CPO except to reveal accurate performance data. For example, it would be permissible to state that an aircraft is "in the 80 mph class," when actually it may be capable of reaching 850 mph.

(3) Technical views that disclose no classified matter.

(4) Public display of equipment, if adequately justified. Because to our knowledge no cost to conduct shall be prohibited if it represents classified equipment would result.

f. **Safety Phase C5.** Equipment in this section is publically disseminated to prevent sale to domestic concern of the United States as undeclared equipment. They concern, however, sufficient classified information concerning this equipment to enable export or trade to foreign concern particularly to the interest of national security.

Such data as are necessary to assist, maintain and operate may be furnished to purchasers and prospective purchasers.

Classified publications may not be mentioned and shall be removed prior to use. Artistic and advertisements prepared for public release, which are otherwise revealing, thus a permissible within the preceding sections, are subject to separate review by CPO.

g. **Safety Phase U.** When no component or project is listed in Phase U, it is considered declassified, provided all classified components and equipment contributions, if any, are first secured.

—WIC

CAB Proposes DC-3, L-18 Modifications

Cert Aircraftmen Board has proposed modifications for Douglas DC-3 and Lockheed L-18 Lodestar that call for an increase in takeoff power limitations from 1,200 to 1,350 hp provided it does not adversely affect flight characteristics of the transports.

Other features of the new proposal include:

• Increase takeoff power to more than 1,350 hp per engine if maximum gross weight is shown with powerplant contributions,

flight characteristics and ground handling improvements.

• New maximum certified weight of from 25,700 to 26,900 lb for the DC-3 and 16,100 to 18,500 lb for the L-18 can be established at the airframe meets strength requirements.

• Maximum gross weight of more than 26,900 lb for the DC-3 and 18,500 lb for the L-18 may be established in accordance with the performance, weight limit, flight characteristics and ground handling requirements.

An airplane flight manual would be provided for each DC-3 and L-18 that has new maximum certified weights. Comments on the new modifications can be sent to CAB before Feb. 30 for consideration by the Board before the proposal is adopted.

Comet 2 Tests

- **First airliner begins final trials, sets speed mark.**
- **New transport relieves gloom caused by crashes.**

(McGraw-Hill World News)

London—De Havilland Aircraft's first production Comet 2 is on the last lap of flight tests, flying 3,050 mi nonstop from London to Khartoum, where, so far, no evidence about Comet crashes has been made known. All the wreckage that is left of the BEA/Csair 1 crash near Colombo last May is being used by putting pieces onto a wooden framework.

Dr. E. B. Walker, head of the structures dept., says his men have established the possible sequence of failure in the Comets' cracks.

"We think that the starboard tail plane failed first," he says, "and then the port tailplane. Then the starboard wing failed and then the other wing." What caused that sequence of failure? Dr. Walker's Johnson birth for such an answer could not be ruled out as primary cause. No structural weaknesses have been found.

His broad conclusion:

• Comet 1 into weather that would break up any aircraft—

• Something happened which led the aircraft into a very abnormal condition of flight."

• **Overspeed?**—These thoughts come close to accepting reasoning along the report last June of the official enquiry into the BEA/Csair 1 accident in the Sudan. That report, based on *Woodcock* appendices, clearing "primary failure of an elevator span fairing" started the sequence of failures in the cracks (Aviation Week June 18, p. 17).

De Havilland's aircraft industry also is closed by the program's record loss-Khartoum flight, taking off at 13:00 hrs. on Aug. 25 and arriving 10:30 hrs. on Aug. 26. The aircraft had 6,900 lb of fuel and 25 passengers. It did not adversely affect flight characteristics of the transports.

Conflicting Reports.—Meanwhile, reports like the one the BEA/Csair 1 crash Jan. 16, killing 55 persons, are growing more often than not conflicting.

Other than the fact that an explosion apparently occurred under the floor of

the fuselage, investigation has made it show any cause light on the cause of the crash. Salvage operations to recover the wreck from some 600 ft of water will take quite a while if they succeed at all.

At London Airport, BAC's "impressive and unique" research laboratory, one of its anechoic chambers, Comets have failed to produce any clear-cut results. Studies now are underway to remove疑虑 with the Comets' Master of Transport Also Leader Boyd officially is responsible for this decision, despite the fact that BOAC, not the airlines, grounded the aircraft originally.

Sir Leonard Ford last week: "The question of returning the aircraft will be faced up to long before the report [of the investigating board] is issued."

• **Wingless Plane.**—From the structures department, The Royal Aircraft Establishment at Farnborough, comes word, was evidence about Comet crashes has been made known. All the wreckage that is left of the BEA/Csair 1 crash near Colombo last May is being used by putting pieces onto a wooden framework.

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HORTEN PROTOTYPE leads at Santa Ana, Calif., after successful 28-min. flight

Horten Flies Wingless Aircraft

Santa Ana, Calif.—Designer Willard E. Horten has made the first successful test flight of his "wingless" Blotan experimental aircraft at the Orange County Airport here.

He plans to conduct production by Horten Aircraft Co. of a flightworthy model capable of nonstop flight from Los Angeles to New York at 100 mph.

Horten and his associates spent three years a year modifying the design of the unsuccessful aircraft after it failed to reach record flight distance in its first flight, Nov. 23, 1952. The plane landed at a cleared field after straggling through the air for a mile in a stalled attitude.

• **Maximum L-10.**—The 37-1/2-psi engine developed only a successful flight of the HW-N-16-52 planes when he based the theory of the limiting of velocity pressure. He explains that an minimum use for 100 ft of air at that point can be the aircraft's maximum velocity.

• **First flight.**—Horten's first successful test flight lasted for 20 min. After climbing to 3,000 ft, he put the strange craft through climbs, banks, turns and glides—during which "the handle became hot."

• **Low-Cost Transport.**—Horten asserts that the combination of extremely high lift with low wing loading provides safety in flight of a potential day planes and characteristics the need for long, inexpensive runways for aircraft with heavy payloads. The design will provide the lowest cost per ton-mile for air transport operations yet possible, he says.

Horten commented somewhat modestly after his flight that "the proves the theory." Yet that is nothing about the press reactions that audience the Horten design, as "the greatest innovation engineering achievement of all ages" and "the

greatest advance in aviation since the advent of flight."

"Bill Horten," says the announcement, "has increased the maximum range of an aircraft." The man who designed the airplane which often "100% greater payload with 100% greater range" belongs to the same class with Gagarin and the Wright brothers, it appears.

► **Experimental Model.**—Horten's the HW-N-26-52 is an experimental model to test his new theory and bears little relationship in appearance to planned production model. Visibility is very poor, he admits, but that will be corrected in production models by moving the cockpit forward.

Designation of the aircraft as "wingless" appears to be a misnomer, because a good deal of wing area is in evidence. This is accomplished by two retractable wings, one centered around the high-lift airframe, which Horten says is in relative motion.

The retracted wings are tandem, linked caused large, and on these are mounted the ailerons of the conventional three-control system. Extended in flight, they may be extended on the ground to serve as wingspans.

The aircraft is constructed of a complex tubular steel framework covered with fabric. The aircraft was built with radio to order and extension of the so-called control span that extends this width to 44 ft. It is 38 ft long. Wing loading is given as 8.5-9.7 lb/sq. ft. Power rating is given as 5,000-6,000 hp, and weight is 11 to 12,000 lb.

Horten says his aircraft will be the first to make a nonstop flight of the distance between cities will be 600 miles.

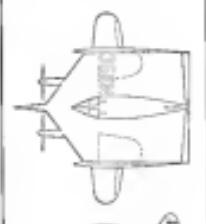
The aircraft was carried slant by two 400-hp Pratt & Whitney Wasp, which replaced the 120-hp Jacobs engine and during the attempted first flight.

Other designs since that flight include larger propellers, control surface modifications and changes in the cyclic gear.

The pilot-designed aircraft, landing speed at 50 mph and emphasizes the safety factor of the aircraft's low landing speed in takeoff flights. His design also is the aircraft's flying speed, which he says to say he was indicating about 125 mph on his first flight.

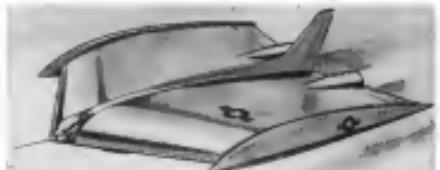
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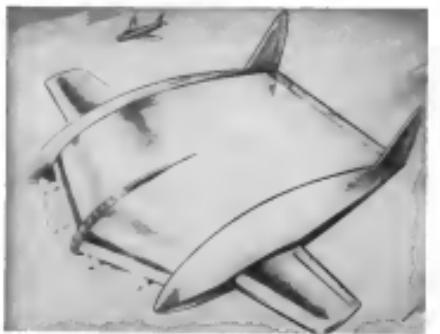


CONFIGURATION of prototype Blotan

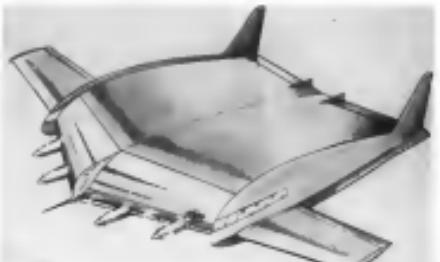
Horton Has These on the Drawing Board...



INTERCEPTOR-BOMBER, powered by two turboprops, is designed for 10,000-mi. range. Two versions of the type are contemplated, one with 45-ft span, one with 60-ft span.



JUNIOR TRANSPORT, now by Horton is capable of lifting 4,000 troops more than 25,000 mi. at speeds in excess of 400 mph. Engines would turn out 25,000 hp. each.



PASSENGER TRANSPORT is suited to hire 500 passengers side-by-side having visibility through transparent roofs above powerplants. Its planned range with a 10-ft.

spur nose. The proposed executive model may have pusher propellers.

Single radar in the center of the fuselage is conventional, but vertical control is provided by a split device mounted below and to the rear of the craft and extending from side to side. The executive model calls for radars mounted on the trailing edge of the surface.

Reversible landing gear and the lateral control flaps are electrically operated.

► **Adaptable to Turbines**—The design is adaptable to reciprocating, turboprop or turbogear power, according to Horton, and the present experimental aircraft is only the beginning of a new aircraft based on the scaling of parasite theory.

Design proposals call for:

- Trijet-powered interceptor-bomber that could circle the globe and be "probably the most deadly flying machine of any age."

- A 500-passenger super-transport in which passengers will be seated side by side in a full floor area.

- Four-engine military transport capable of flying 4,000 troops anywhere in the world.

"Another feature of this plane," says the leader of the Juniper, "is the loading and unloading of cargoes with out ever landing the plane."

"Its range of over 25,000 mi. makes it possible to transport complete teams to foreign fields, land the troops and cargo, strike, without landing the plane, hover around for as long as 8 hr., return to the landing zone, pick up the troops and return to an base."

"It can transport loads by air that formerly required ships. Trucks, trunks and vehicles drive in as cargo direct cargo.

This series of machines would depend upon one Horton-designed junior engine of 25,000 hp., according to the leader, and for protection, it could carry its own fighter escort planes right inside.

—WJC

Fire-Razed Meletron Restarts Production

Los Angeles-Melletron Corp., victim of a \$500,000 fire less than four weeks ago, has now production orders again and growing.

Machining shop and fabrication operations have been set up to adjacent, newly leased properties.

"While our present production is extremely limited and we are not yet ready to recall full assembly personnel, we hope to make a successful start toward full production operations," says president George A. Shultz.

Melletron Corp. is a principal supplier of precision precision-accuracy instruments for the aircraft industry.



What it takes... TO BUILD THIS TEAM

Today's most powerful deterrent against aggression are the men and officers of the Strategic Air Command and their global B-52s. No combination of men and machines — by these more existent — has ever been such a force for peace!

To build this team, Convair and the United States

Air Force developed production and training techniques unequalled in the history of aviation. From the beginning both the B-52 and its crews had "growth potential" designed into them. And indeed, the storied age made this team even more formidable in national defense.

Finally, Air Force and Convair join in to insure the maximum degree of performance — the 10th degree of air power.

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TOOLING FACILITY

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SHORTENS DELIVERY • SIMPLIFIES
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Mock-Up of Fin

ANOTHER service, exclusively offered by Omohundro to users of fibreglass laminates, is a tooling facility within Omohundro's own organization.

Tooling know-how within the organization shortens delivery time and simplifies problems of quality control. We can tool to any source of customer information—

ENGINEERING DRAWING
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quickly and with better control.

FOR SPEED-EFFICIENCY-ECONOMY

Find out about the tremendous advantages of dealing with a reinforced plastic supplier with its own tooling facility! Contact—Paul Omohundro Company, Box 606, Paramount, Calif., T-Orrey 7-6217.



RIDGE BEAMS. Simplify tooling costs for composite laminates, eliminate need for separate mold supports, and reduce tooling costs for short-run production.



PARALLEL BEAMS. A unique design for composite laminates, eliminates laminating, body, and other tooling costs. Simplifies the 3-point measurement of mold stresses during weight distribution, personnel safety, and preventive tools or live load.



OMOHUNDRO

Southern Representative: C. P. Waggoner Co.,
Box 1197, Grand Prairie, Texas



DEFINITIVE COLORING of new Cessna 310 business plane in down-up in flight view



SHORT-SWEEP WINGS and shallow engine nacelles are highlighted in plane when up

Cessna 310 Price Tag: \$49,995

New twin-engine business plane carries entire fuel supply in tipples at maximum distance from cabin, along with spacious as standard option

By James A. Klim, Kim, Incorporated in January this company is the successor to now defunct Cessna business plane with a single showing of the aircraft at the 1966 Paris Air Show. The aircraft is the Cessna 310, a new development of its price \$49,995. Bureau registration: N31000. (Photo: Jim. 11, p. 13)

Designers are taking orders with deposits. Some 300 members of the Cessna international sales organization attended the showing.

220 Mph. Top-flight officials specified terms for the new 310 plane at a top speed of 220 mph at sea level. Maximum gross weight is 4,000 lbs., of which 1,710 lbs. is useful load—including the passenger, fuel tank and oil tank plus 351 lbs. of baggage and optional equipment. Maximum weight of the aircraft is 3,800 lbs.

The 310 spans 35 ft., is 27 ft. long and 10 ft. 6 in. high. Powerplants are Continental 3470-B flat engines, each developing 240 hp at 2,600 rpm using 91 octane fuel. They are similar to the engine used on the Cessna 310, with these differences: higher compression, new-type head with sheeted valves and high lift cam.

The fuel tank is fitted with bladder-type fuel cell. This type of insulation places fuel at the minimum distance from the cabin, as important safety factor in event of crash. In addition, they allow the main landing gear to be fully retractable into the wings, lower-

ing speed slightly, and also provide an outplate offset that allows the same lift coefficient with a shorter wingspan that a larger wing would give without bladders.

Retracting the sheds onto the wing webs permits the use of shallow engine nacelle. On the 310 there is a maximum depth of only 21 in. Front drag is reduced by designing the nacelles to be parallel to the wing's dihedral.

A cross-hatched truss is employed so that the pilot can see the route on opposite wings to supply engine exhaust. There is an auxiliary electrical heat source.

Other Features. Front seats of the four-place tubes have an aisle between them so that the pilot can return to his place without difficulty after landing passengers. A large door extends from the front door post in a pivot mechanism between rear and front seats so that entrance and exit are possible without disturbing front seats.

Landing gear retraction is electro-mechanical so that the pilot, in event of electrical failure, can disengage the rams and manually lower the gear. If either electrical or mechanical fails, the gear will lower by gravity weight after being released, locking the shock. Nose wheel is steerable to 15 deg. in either direction by using the rudder pedal. Beyond that, the wheel will castor through up to 35 deg. on each side of center.

Lage flap, operated by an electric motor, can be lowered 45 deg.

Performance Details. The company gives the following figures for Model 310 performance, noting that 60% power setting of 18,000 ft. is obtained in using 194 oct. fuel at 2,500 rpm, and 50% power is obtained at 18,000 ft. by using 100 oct. fuel at 2,200 rpm.

Cessna lists 3755 power at 8,000 ft. in 25% drag, 60% power at 10,000 ft., 50% with 20% power at 10,000 ft. and 4711 mph. Range at 60% power at 18,000 ft. is 875 mi. and at 50% power at 10,000 ft. is 1,260 mi.

Rate of climb with both engines at sea level is 6,026 ft. in 1,700 fpm, at 6,000 ft. (16,330 ft.) is 3,350 fpm; at 4,000 ft., 2,000 fpm. Two engine service ceiling at 4,600 ft. is 26,000 ft., at 4,300 ft., 22,000 ft. and at 4,000 ft., 19,000 ft. Single engine service ceiling at 4,600 ft. is 17,000 ft., at 1,300 ft., 9,300 ft. and at 1,000 ft. is 6,000 ft.

Some 20 aircraft make up the 310's standard equipment listing, including a 20,000 lbs. Stewart Warner header with bladders, dual variable pressure gauge, dual electric trimmer, directional gyro, artificial horizon (vacuum-driven), electric baro, air temperature gauge, dual heat temperature gauge, cabin dehumidifier, and a 250-watt Grosses landing light among others.

is this your
timing problem?

Sorry . . .
A. W. HAYDON CO.
can't help you -

Only instruction, practice and
patience can improve your time!

But
. . . if your problem
is PRECISION TIMING

you may save time, trouble and
money by investigating what our
timing engineers have done for
others. Our A.C. and D.C. servos
units may already include the
solution of your most complex problems.
Why not find out?



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catalog manual.

India Gives Notice On U.S. Air Pact

(McGraw-Hill World News)

New Delhi, India has given formal notice to the United States that the India-U.S. air agreement will be terminated in 12 months, a decision described by observers here as an effort to obtain a greater share of traffic for its national airlines.

An official statement back up the charge, saying the government wants to negotiate a new pact that would strip Pan American World Airways and Trans World Airlines flights "in so far as to conflict with consistent operation and development" of government-owned Indian airlines.

► **Adequate to Demand**—India strongly objects to a provision in the present agreement, said in Nov. 16, 1966, that Pan and TWA capacity at "adequate to demand."

But U.S. officials say the two U.S. carriers are not taking even from Air India International's traffic volume and don't. New Delhi complains that Pan American and TWA operations in India are violating the principle of the Fifth Freedom.

► **Dutch Protest**—Action to end the U.S. agreement follows a protest by The Netherlands that the U.S. just forces Pan and TWA over KLM Royal Dutch Airlines.

Under agreements with Holland and Britain, India has a sole right of flying between KLM and British Overseas Airways Corp. flights in the country.



Putnam Flies His Own

Clinton Putnam, DeHa-C66 Air Lines head charterman, is seen with his new Aero Commander 500. He keeps a phone in plane to use in keeping contact with the nation's flight activities. Putnam holds both commercial and multiengine pilot ratings and expects to log more than 400 for this year.

AVIATION WEEK, February 1, 1964

New open at Lockheed in California...

131 new career positions for engineers



Lockheed's expanding program of diversified development is resulting in more and better careers for engineers.

Projects in development include:

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2. **nuclear energy**—Lockheed has announced a contract to study nuclear energy applications to aircraft.

3. **advanced fighter**—Lockheed has received a development contract for the highly advanced XF-104 day interceptor fighter.

4. continuing development of production aircraft

—Development work on production aircraft is continuing at Lockheed. New orders for the Super Constellation have increased Lockheed's backlog to record levels. Lockheed now flies 178 aircraft throughout the world as Super Constellations carry customers.

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VOUGHT REGULUS surface-to-surface Navy missile is boosted skyward by Roto-Stat rocket to benefits test. It is not apparent in photo (below) of Flight Test Vehicle 3.

Navy Tests Vought Regulus Missile



FLIGHT view of Regulus XASM-N-2 delta-wing missile landing gear with dark nosecone.



TOUCHDOWN is made under eye of pilot in Navy Lockheed TQ-1 (FROC) right.



BRAKING CHUTE OPEN to slow landing rate, simulated Regulus near end of a test.

Mexico May Shelve Airline Ticket Tax

(McGraw-Hill World News)

Mexico City's new transportation law passed here this month, calling for imposition of an \$18.50 on all tickets purchased in Mexico for international airline flights, but excepting Mexican congress, probably will not be applied, informed sources here say.

U. S., Canada and The Netherlands have filed formal protests against the discriminatory levy. The tax was scheduled to take effect Jan. 22.

However, it was learned that influential high Mexican government officials were aghast to learn of the new law and are planning to stop it.

The tax would probably be imposed on each U. S. carrier of American Airlines and Pan American World Airways, while granting an advantage to Compagnie Mexicana de Aviacion, which flies to Los Angeles, Houston and U. S. border points, and to Aerovias Cuban, which has a route between here and Mexico.

Later company has felt the most strong competition from new aircraft introduced by American and Pan Am.

U. S. has an agreement with Mexico, thus making it difficult to protest such additional taxation. Cuba, however, is reported planning to redouble against Mexico if the air transport tax is imposed.

Board Lowers Mail Rates of Four Airlines

Civil Aeronautics Board, hearing to Post Office Department pressure, temporarily has lowered mail rates of Braniff, Capital, Delta, CMS and Western Air Lines.

The Board also has finalized permanent reduction of National and Northwest Coast Airlines' mail rates from 55 cents to 45 cents each way. This is the same maximum regular airmail rate. But American, Eastern, Trans World and United Air Lines have no change since 1959.

The new rates reflect for the four smaller airlines rates between 45 cents on routes where they compete with the other 45-cent carriers and 55 cents on noncompetitive routes, same as before.

When the Post Office recently announced it would ship mail via the scheduled airline with the lowest rate effective Jan. 1, 1954, CAB proposed lowering rates of high-rate carriers as competitive rates but increasing them on other routes to offset the cut.

Post Office Department argued, in the Board's last hearing, the noncompetitive rates were below (55 cents) pending investigation.



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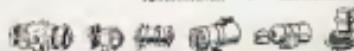
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altitude. Duration of flight from launching to impact is about 3 min.

Payload of the Aztec is about a 150 lb. and approximately 6 cu. ft. of space is available for instrumentation in the hitherto used nose compartment. Welded construction is used throughout. The main body is an integrally welded stainless steel tank assembly. The pressure tank, which contains the fuel for ignition of the liquid propellant, is located at the forward end of the nose section and of the rocket. This latter pressure applied to the pressure tank causes the propellants to flow into the thrust chamber for combustion.

The attachment of the nose section, a rolled-up steel sheet is welded to the forward end of the pressure tank. On the other end of the tank, a rolled sheet cylindrical section for auxiliary storage is welded. A half barrel of rolled sheet is welded to the exhaust tank, separated from it only by a thin formed baffle.

Rolled and welded construction also is used for the nose skin. It then is spun to an upward slope to house the payload.

Army General reports that a cylindrical container is often used for solid payload vehicles. This is a rolled sheet which is welded to attachment casting.

The rocket's fins are produced by welding the edges of sheet metal and a plug which is then removed. Spars are available for reinforcement.

Welded components also are used for the rocket thrust chamber.

THRUST & DRAG

Description of a new kind of anchor quoted in a West Coast newspaper:

"The inventor explained that the push-and-pull, winding to return upon the user timing system, turns the now-abst part in the same concentric direction. The device is turned off center and at right angle of course is at full efficiency to the push-and-pull."

"It is started by simply pulling a lever and the power mechanism will not only drive the plane, but will balance and govern it in the plane will glide safely to a landing without human assistance."

To the flat engineer who sends in a sketch or model of the machine developed solely from that description T.O.D. will send a genuine Lockheed Model sheet, washable sheet, washable sheet, washable sheet, washable sheet.

The only iron-cast socket not yet available is located where described on the campus of Princeton University.

Add to your list of IAN standards these five extremely useful inventions, which—according to the *de Havilland* (of England) *Classified*—“designed in the light of many years’ experience by a team of aircraft firms, who for obvious reasons prefer to remain anonymous.”



• **Dreadnought Belt.** Very useful when holes are slightly out of line. Available in various misalignment sizes up to 1 inch.

• **Lockset Nut.** These nuts are available tipped at various angles. The nut is held while the bolt (and the respective) head is turned.

• **Handlead Handi-Belt.** For use when holes have inadvertently been drilled rather close to the heads of studs or brackets.

• **Hoistax and Shantuck Ratchet.** Two ratchets whose mechanism is usually supplied.



LOCKHEED'S F-94 Starfire uses Timken tapered roller bearings in the wheels for protection against G loads.

Starfire shoots the chute to slow down, TIMKEN® bearings take the landing wallop

LOCKHEED'S 600 MPH Starfire hits the runway at high speed—and hard! A new deceleration parachute lets it land in half the distance. And Timken® bearings on the wheels easily take the shock loads of the landing impact.

To take the heavy shock, these Timken bearings are case-hardened to leave a rough shock-resistant core under a hard, wear-resistant surface. And fine contact between rollers and races gives extra load-

carrying capacity—maximum capacity per pound of weight. Their tapered construction bears more on the outer race than on the inner race, so they carry both radial loads and the thrust loads of cross-wind landing. They normally outlast the wheels.

Timken bearings have extremely low starting friction that lets the wheels accelerate rapidly when they hit the runway. The tire wear is held down. The race rolling motion and incredibly smooth surface finish of

Timken bearings practically eliminates friction.

Be sure to specify Timken bearings for landing gear and other airplane applications. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canada: plant: St. Thomas, Ontario. Cable address: "TIMROBCOP".

 The symbol is a heraldic shield with a bearing as the base.



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To the Employee Relations Director of every American company

LET'S FACE IT . . . the threat of war and the atom bomb has become a real part of our life—and will be with us for years. Fires, tornadoes and other disasters too, may strike without warning.

The very lives of your employees are at stake. Yours is a great responsibility. Consider what may happen.

When the emergency comes, everybody's going to need help at the same time. It may be hours before outside aid reaches you. The best chance of survival for your workers—and the easiest way to get back into production—is to know what to do and be ready to do it. To be unprepared is to gamble with human lives. Disaster may happen TOMORROW. Insure that these simple precautions are taken TODAY:

Call your local Civil Defense Director. He'll help you set up a plan for your offices and plant—a plan that's safe, because it's already integrated

with community Civil Defense areas.

Check contacts and locations of first-aid kits. Be sure they're adequate and up to date. Here again, your CD Director can help—with advice on supplies needed for injuries due to heat, radiation, etc.

Encourage personnel to attend Red Cross First Aid Training Courses.

Encourage your staff and your community to have their houses prepared. Run ads in your plant paper, on local newspapers, over TV and radio, on bulletin boards. Your CD Director can show you ads that you can sponsor locally. See the standard of preparedness in your plant city. There's no better way of building prestige and good employee relations—and no easier way of helping them.

Act now . . . check off these four simple points . . . before it's too late.



PRODUCTION

How to Get and Hold Your Engineers

* Survey pinpoints weak spots in employer-employee relations; suggests closer liaison with colleges.

In the right order for engineers: talent; two broad factors preoccupy you; you've got to attract the engineers. Second, you've got to hold them.

The factors influencing these concern personnel considerations as numerous as complex, and there are no hard and fast rules. Employer-employee expenses and expenses, however, allow a keen insight for a proper approach to the get-and-hold problem. This is the information obtained in a survey conducted by the Personnel Department, College Board, for the independent corporation of the National Society of Professional Engineers. From the survey, it was clear 2/3 of the nation's engineers are dissatisfied with their job and their employer.

The third report¹ is a survey of each five member states: Delaware, Illinois, Ohio, 1, 1952, p. 21) is designed to show industrial executives how to create a climate in which a professional can work happily and effectively in an employee capacity.²

Highlight items of the report:

* Salary considerations show 43% of engineers-employers surveyed are dissatisfied. An average of 38% with except executives with a higher rate of pay and a greater responsibility, even if a security of employment was involved.

* About 34% of the engineers feel their interests would be strengthened by membership in a collective-bargaining organization.

* In the Survey—Covered in the survey are more than 1,300 engineers and more than 200 companies collecting 1,425 plant facilities separated into chemical, electrical, automotive, chemicals, petroleum, steel and other heavy industries, construction, mining, etc.

Manufacturing industries employ first place—engineering 42% of the engineers—employers and 44% of the executives who answered questionnaires.

The survey's typical engineer, selected from an age range of 21 to 50, is 34 years old, and, with time out for military service, has been an engineer for nine years, has worked for his present

¹ How to Attract and Hold Engineers—National Society of Professional Engineers, Available from National Engineers Board, 1000 Broadway, New York 10036.

How Would You Answer?

Executive Views—

Engineer-Employee Views—

- * Are you providing engineering students brought in for a summer of work before or during school year?
- Answer: Yes . . . 80% No . . . 20%
- * Does your company offer special training programs to fit junior engineers for better positions?
- Answer: Yes . . . 45% No . . . 55%
- * Are engineers informed of their personal progress as well as their professional?
- Answer: Yes . . . 35% No . . . 65%
- * Is engineering talent put to full use?
- Answer: Yes . . . 40% No . . . 60%
- * What incentives are offered to your engineers?
- Answer: Job security (35%), opportunity for steady advancement (30%), further professional advancement (15%), profit sharing or stock bonus plan (10%), other (5%)
- * Has your company conducted an attitude survey among its engineering employees in the past year?
- Answer: Yes . . . 55% No . . . 45%
- * What is degree of "interdependence" between management and engineers in your company?
- Answer: Fair (25%), good (45%), excellent (30%)
- * Is which "partner" activities does your company encourage you to participate?
- Answer: Writing for technical publications (20%), teaching, lecturing (15%), community affairs (10%), professional societies (14%), other (11%)

employer, a large manufacturing company, has an open seat. The report concludes that as one of more than 200 companies in the survey, it is not unique to do this. In fact, it is one of the often-given rate of field assignments, especially for older persons.

Schooling Factors— Examining just one dimension, the survey pushes back with the surprising school connection.

What 85% of the engineers feel is that the engineering schools turn out a man with an adequate knowledge of scientific fundamentals, a majority (62%) believe that newcomers to the engineering ranks are sadly deficient in other areas of study. Engineers indicate agreement with the deficiency.

Engineering is a field which needs to be strengthened, and, having a solid educational background is a definite plus.

On the other hand, the engineers factor in job satisfaction, 45% of engineers who indicate that they were not satisfied with prospects in current employment embrace 90% of those who feel adequately prepared academically.

One executive, an engineer himself, puts it this way: "Too many of our engineering schools have become so over-specialized, it is to be put much better than trade schools. The so-called 'general' courses will produce managers and constructors, but they will not get to the graduate the well-rounded background without which he

cannot hope to progress very far up the professional ladder. This, in my experience, does not come for a happy as well as diligent worker."

► **Not Enough Interest**—This executive feels that industry should maintain a closer liaison with colleges, more faculty and administration with corporations. He says it up: "We're all very much interested in the schools every spring, a few months before a new batch of graduates is turned out and made available to industry, but we ought to be interested for 12 months every year!"

This view for a closer liaison approach to industry's needs is echoed in a conclusion of the report, which adds that industry leaders could and should participate more fully in college programs by presenting itself as a good employer, short courses designed to give the cap-auditing student a closer picture of the profession, which he plans to make his life's work.

► **Breeding, Holding**—What are some of the breeding techniques used to attract young engineers? The report details these procedures, points out which are effective and why.

"What techniques or techniques has your company found most effective in recruiting new engineers and placing?"

Stripped of embellishment, the answer is a large number of executives bent down to the word "Money."

Yet, most of the engineers don't go along with this viewpoint—only 12.1% mention financial rewards for their efforts of recruiting as a problem.

Nevertheless, the report emphasizes that answer to others.

Look especially in the conclusion that the engineer's rate of pay should

own one of the most important factors in keeping him interested. It will

be most important, after he gets over

his apprenticeship, and the amateur

glass at entering a new profession.

A majority of the executives report that others of more ability by competing firms constituted the largest single factor in their engineers' leaving. The report points out, however, that that is not necessarily true of the engineer who has been in the profession long enough to have acquired a solid and steady. Younger engineers (those at training) who responded were satisfied primarily with salaries and other job factors. From this situation it is deduced in the report that money is not going to be important a factor in some as entering as some of the younger and more aggressive engineers before them.

Old-line firms generally rely on standard advertising techniques—newspaper and word of mouth advertising, some engineer interviews and interviews by their own employer. Some don't do any recruiting.

Training and other studies are among

incentives offered as substitutes for direct recruiting.

► **Letdown**—One thing the report on engineers doesn't cover is a problem. Notified of the report's conclusions that answer to others.

Look especially in the conclusion that the engineer's rate of pay should

own one of the most important factors in keeping him interested. It will

be most important, after he gets over

his apprenticeship, and the amateur

glass at entering a new profession.

About 29% of the engineers feel that their professional status is not recognized, 16% do not feel that their income and abilities are being utilized effectively.

► **Career**—Engineers feel that one of the most successful techniques is to let them know what they can expect during the various levels they reach during their career. This gives the student an idea of what will be expected of him, which gives the company the chance to weigh his capabilities.

Other recruiting techniques found effective by companies participating in the survey include a wide variety of work assignments for engineers from, with products of a highly rugged nature, provision of overtime pay, profit-sharing plan, payment of travel and moving expenses for new employees, extensive vacation benefits, use of employee-shuttle or round-trip in oil rigs, and advertising in technical magazines.

► **Attitudes**—While the engineer enters the profession first because of aptitudes (71.9%), secondly because of professional status at work (34.8%), and lastly because of financial reward (11.3%), according to the report, after he has been in industry for a time his attitudes change.

"Are you satisfied with your present job?" That question brought answers ranging with respect to the different factors as follows: 49.7% respond (54%) working conditions (7.6%), sense of work (16.9%), and location of work (11.5%).

Many of the executives feel that the engineer's dissatisfaction with industry is a manifestation of a "something-for-nothing" attitude. The apprehension of engineering personnel for a large western aircraft manufacturing concern puts it this way: "Young engineers must be made to realize that their engineering understanding must be converted to productive output. Too many of them feel that they can understand a bigger job, but overlook the fact that their output can bring present job in from scratch."

More than half of the engineers do not know whether they employees are satisfied with their work. There is also



Copter Engine Test Rig

An engine for Westinghouse EH100 is test run at Kaiser-Frazer Corp.'s Kaiser Engine Division, Detroit, a bought through U.S. subsidiary test run by Westinghouse. The engine is one that passes a series of tests in horizontal position, the other direct



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The CF100 with its two ORENDA jets, designed and built by AVRO Canada, is the delight of the men who fly them. While present production of this potent defender is for the R.C.A.F. guarding the North, the versatile aircraft is capable of this variety of tactical assignments:

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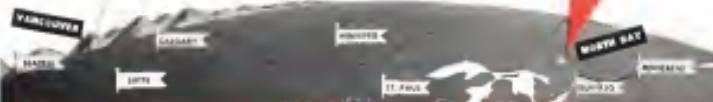
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a feeling among the engineers that their professional abilities are not being utilized fully.

The report states that further work on improvement of communication between management and engineers seems indicated, and that possibilities of a merit-rating system should be explored. TERSO of the engineers say they would like to have their work evaluated by a merit-rating system.

► **Professional Benefits.**—Of the 1,000 engineers interviewed, 870 feel that the young engineers' attitudes are ungrateful. Yet, a majority of the engineers participating in the survey admit that little or no distinction is made between engineers and non-professional employees in as far as pension policies are concerned. The 47% who say they observe the distinction, for the most part do so only to the extent that they pay their engineers' salaries on a monthly basis and do not repair them so much that they break.

Despite this, it is evident that some ungrateful distinction generally is observed, the report says, for only 29%

of the engineers queried say they do not feel their companies recognize their professional status.

The report states that membership in professional societies, and participation in technical, cultural and civic activities should be encouraged actively, both for the professional growth and social enjoyment of the engineer. Public relations benefits also will serve the company from activities of that nature.

► **Influencing Factors.**—Health and insurance closely linked with the engineers' work is most effective, in holding him, the survey shows. Health insurance, security, etc., as indicated by the fact that of the men over 1,400 respondents to the questionnaire, 42% respond to the questionnaire, 42% say they would not accept a higher paying job, with more responsibility, if they were not assured of the same security of employment as exists in their current jobs.

Benefits such as the usual group-life protection, low-cost insurance, pension plans and recreational facilities were shown new employees, but the company

that does not offer them is at a considerable disadvantage both from the standpoint of retaining and keeping employees happy, the report states.

Benefits, in the opinion, are offered to all employees, professional and non-professional alike, as are many of the incentives, the report points out, but from the incentive category comes any greatest influence which may be shown engineers and other professional groups.

► **Typical.**—Stearns-North American Aviation, Inc.'s program is cited as typical of those offered by the larger industrial plants. Like nearly all companies today, NASA offers a group health insurance plan, but in this it has added a blood bank. It also has a \$100,000 a year recreation program, half paid by company funds and half from voluntary insurance profits. Activities include base ball, basketball, football, soccer, boating, swimming, tennis, bowling and other sports.

Stearns at NASA offered the opportunity to buy quality tools at greatly reduced prices. Other fringe benefits are the company's many

A training program offers courses on the basic subjects through the college level, with about 175,000 engineers having benefited since the program was initiated in 1948. Stearne may also be pleased to outside educational institutions, with non-attendance of two-thirds of the cost by the company if grades are passing. The suggested box wagon is another strong incentive. Many of these incentives are offered by many organizations in the aviation field.

Indicating how far some companies go in offering services to the employees, the report mentions E. I. du Pont de Nemours & Co., Wilmington, Del. Du Pont's free psychiatry service is a vital cog in the company's production machinery. The company has learned that industrial psychiatry, instituted there on an experimental basis in 1944, gave worthwhile dividends in increased production and a constantly improving safety record.

It would appear, the report concludes, that there is still plenty of work to be done with profit in the field of incentives.

► **Opinions on Unions.**—"Do you believe engineers' interests are strengthened economically or otherwise by membership in a collective bargaining organization?"

Answers showed that 66% don't think so, while 34% answered "yes." In this group of 34% were approximately the same proportion of contested and uncontested engineermen plus, the report says, adding "It is evident, therefore, that the long-standing labor organizations of so high a percentage of men who are profes-



F-89 Timersavers

New shot said at Northrop Aircraft, Inc., Hawthorne, Calif., to speed production of F-89 interceptors, division of fighter include photo checklist placed in a folder used for large scale documents, and transparent Teflon-like cloth covering together the checklist and the folder used in assembly. In photo above, Lucy Stein, head of Northrop's inspection staff department, holds a sample photo checklist which consists of specially reduced drawings pasted up on official sizes. At left is stack of 130 blueprints and other documents normally required to inspect one scale panel of F-89, next to it is smaller pile of equivalent photo checklists.



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ments both by training and education has kept it in association with their attribute toward their own job."

The fact that so high a proportion of engineers favored automation, results "in a startling trend which, if it continues, could become a movement which eventually could reduce the proportion of engineers to the level of a trade," the report states. In a survey one decade earlier eight years ago, only 5% expressed themselves as favoring automation.

Of the 34% who believe in either large bargaining agencies, few come from the group which had been graduated within the last two or three years. Most of them fall within the 25-to-35 age group.

The report concludes that the possibility of widespread, vigorous union or grassroots activity among engineers is not the industry's single one, but there has been an "alarming increase in the number of engineers who have so far chosen accepted professional standards as to consider unionization as a feasible option."

The report says: "This trend could easily morph into an unpleasant act, likely particularly in the event of a business recession, and it serves as a clear warning that the professional engineer and industry must take immediate steps to forestall the all-too-easy drift away from professionalism to trade unionism."

Concurring in the suggestion of a university president viewing the union situation, that industry increase the rates of pay for that "worthily neglected" group, the engineers with three, five, ten or twenty years of service "congratulate with the highest enthusiasm," the report says that this is to



Wire Coiler

Wire coiler, developed by Clevite, employs automatically each circuit, using after it has passed through stamping machine, replacing previous manual method. The device consists simply of a circular coaction coil mounted on a bottom plate. Wire moving through machine forces device to rotate and coil wire. Now in use on 15 Clevite machines, company says device saves 10,120 man-hours.

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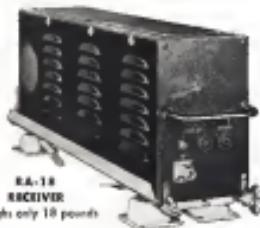
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and driving of careful study by man against, on some of the best that the aircraft industry, although starting after the engineers were set at a high level, the speed between rates of progress for beginners and those for experts must engineers is small.

► **Non-Harmonics**—Arapostoli says a fairly accurate conclusion from the standpoint of age, 60% of the respondents and their wives have a non-harmonics depression within the company. For the purpose of establishing a uniformity of interchange of ideas and improving communications with non-harmonics.

Several of those who do not want a non-harmonics organization say that all too often such organizations can be using into the status field by a small but never members of promotion from performance. —BS

BuAer Contracts

The following contracts consist of \$35,000 and more and have been announced recently by the Bureau of Aeronautics, Department of the Navy, Washington, D. C.

APRIL PREFERENCE CO. Chicago, Ill. (Contract No. N-1000-1) for the development of a new electronic system program and test equipment. Contract value \$15,000.

ARMED SYSTEMS CORP. Bethesda, Maryland. (Contract No. 34) materials and services for research and preparation for the development of a new electronic system program and related production equipment. Contract value \$15,000.

COMPUTER-CENTER CO. Boston, Mass. (Contract No. N-1000-2) for the development of a digital computer system for the development of a new electronic system program and related production and related services. Contract value \$15,000.

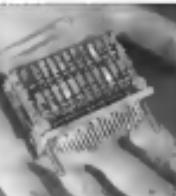
DATA MANAGEMENT & TOOL CO. Brooklyn, N. Y. (Contract No. N-1000-3) for the development of a new electronic system program and related services. Contract value \$15,000.

ELDOCO INC. Los Angeles, Calif. (Contract No. N-1000-4) for the development of a new electronic system program and related services. Contract value \$15,000.

GRIFCO INSTRUMENTS INC. Englewood, N. J. (Contract No. N-1000-5) for the purpose of providing program and test equipment for the development of a new electronic system program and related services. Contract value \$15,000.

INDUSTRIAL ANALYTIC SERVICE INC. (Contract No. N-1000-6) for the development of a new electronic system program and related services. Contract value \$15,000.

WEINGARDNER-FRITTER COOP. Springfield, Mass. (Contract No. N-1000-7) for the development of a new electronic system program and related services. Contract value \$15,000.



JUNIORCOMP-C, small digital computer which may have the control and switch assembly, uses 24 magnetic core logic joint in a chain of eight, each of which can store 12 digit "word," with more than four microseconds.

New Jobs for Digital Computers

Two of three new small digital computers recently announced give added evidence that digital computer designers hope to take a firm control and make available hardware tools previously performed by analog-type computers. (AVIATION WEEK Dec. 29, 1954, p. 27)

The third new computer, a relatively low-cost general-purpose machine, has a radically new type of memory device which gives it a very increased external storage capacity.

The three computers, and their manufacturers are:

• JUNIORCOMP-C and JUNIORCOMP-D, specially

self-checking computers capable of instantaneous solutions of "real-time" problems. Devices were designed by Jacobs Electronics Co., Bedford, Mass., for undemanding military purposes.

• Also, a \$48,000 calculator produced by Logaritec Research, Inc., Bellmawr, N. J. (The device is named for Axel L. Werner Gyr, Swedish inventor and Elié Jacobi brother.)

JUNIORCOMP-C, -D

Interesting feature of the JUNIORCOMP-C is its ability to operate in what is termed



ALI-MAC digital computer with newly developed memory drum drive, which uses 6,000 m. blocks to indicate position of read/write heads. New drum is said to have 200 times the memory capacity of older type units.

real time," making it operationally similar to the first electronic computer, proposed in the 1940s and 1950s.

The C operates from data conveniently supplied by four external sensing devices, computes the required switch readout of four inputting circuit boards obtained from its memory, and presents three continuous variable streams of output data.

If the C were used in an integrated fire control system, for example, the nine input single switch, target azimuth, elevation, and range, rate of interceptor's maneuver about pitch, roll, yaw, static altitude, speed, and attitude.

The three computers output enough

to make computer control easier, lateral aiming error, for example, to be four times less.

► **Processor Decisions.**—The JUNIORCOMP-C samples the inputs 10 times a second and resamples its output at the same rate. If one of the inputs changes abruptly, the C examines the past history of the input to determine whether it is a logic or random a man-made or man-made signal which should be ignored, Jacobs says. This is one of several judgment-type processes which the JUNIORCOMP-C performs.

► **Must Be Solved.**—In order to handle real-time problems, a digital computer must be designed for very high speed. For this reason the C is an all-type machine. This means that when two numbers are being added or multiplied, all digits in the two numbers are operated on simultaneously rather than in small (individual) sequence. The way it handles perform mathematical operations. This required for the C to add two 25-digit numbers in eight microseconds multiplication time in 660 microseconds, division time in 1,000 microseconds. Jacobs says.

► **Several Types.**—JUNIORCOMP-C has several types of memory devices.

• **Magnetic tape stores words, capable of storing a 24-digit word, with an access time of four microseconds. Each of the 24 registers weighs each, 2.2 lb.**

• **Punch cards, used both for storing computations constants and for storing sequence of operations. Rapid access card stored data is achieved by using electronic instead of punch card control sorting. Each program and data block is handled by a single card. Two cards can be changed by inserting a new card. Three punch cards used for computation-construction storage will each hold arrays 24-digit words. Besides access time as an advantage of these cards is one microsecond, Jacobs says.**

• **Soft Checking.**—Every 3.2 seconds

NEW AIRPOWER DOCTRINE Twenty-First Annual

THE NEW AIRPOWER DOCTRINE will guide the destiny of the Aviation Industry for the next three years. Basically the new doctrine recognizes that Airpower is the keystone of U. S. Defense Strategy in the Atomic Age and calls for a continued expansion and strengthening of our national Aviation Resources while gradually reducing the obsolescing

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PROFESSIONAL AVIATION The rapidly increasing utility of Airplanes for Industrial and Professional use is discussed. An important new section on the use of Airplanes in Industry. A complete section and how to design for Business Enterprises will be an additional feature of this section.

PERSONAL AVIATION The New Airpower Personal Aircraft section featuring the latest in business aircraft and business flying. A new section which emphasizes aircraft for business enterprises will be an additional feature of this section.

COMMERCIAL TRANSPORTATION The influence of the Air Transport industry is making a new section in the new Airpower Doctrine. A new section of Safety and Efficiency. What to expect in passenger, freight and shipping techniques. AVIATION WEEK Editors will define and analyze these trends.

— Keynote of AVIATION WEEK's "Inventory of Airpower"

traditional Armaments of surface forces both on land and sea. The new Airpower Doctrine of U. S. Defense recognizes that true Airpower is composed not only of Military Aviation but also of Civil Aviation elements such as the Airlines, Business Flying Fleets and the Manufacturing and Overhaul facilities of Private Industry. This new Airpower Doctrine was developed by the Defense Department late in 1953 and was approved recently by the National Security Council and President Eisenhower. It will be the blueprint for the development of Military and Civil Aviation during the next three years. The 21st Annual Inventory of Airpower issue of AVIATION WEEK will be keynoted by an analysis of the new Airpower Doctrine and its effects on all of the special phases of the Aircraft Industry by AVIATION WEEK's expert staff and documented by official fiscal figures and specification charts.

Inasmuch as the 21st Annual Inventory issue will be a record one in terms of industry usefulness, Military and Government reference, all companies manufacturing for or serving the Aviation Industry are urged to be represented in this edition.

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Alwac

Logitech Research, Inc., which makes the new low-cost personal computer Alwac, is headed by Gino B. Allegro, former supervisor of the computer research group at Northrop Aircraft, which developed the Model 440, an electronic digital differential analyzer. Computer Research Corp., which also makes a small low-cost, general purpose digital computer, Cambridge, Mass., has formed by former members of Northrop's own paper group. Harry was also formerly senior manager of Beale Aviation's computer division.

Alwac is a semi-type, binary machine with an internally programmed magnetic drum memory capable of storing 2,048 words. Machine instructions can be entered from an electric typewriter (which converts decimal numbers to binary code), punched or magnetic tape, automatic tape follows. One output port may be fed to a graphics display or electric typewriter.

New Electronic Memory—LRI has developed a new technique for combining the magnetic storage drum which makes it possible to build large electronic drums relatively inexpensively, increase storage capacity 200 times, company says. LRI says its 48-in. drum can store 1,000 words.

Precision techniques have required precise control of air gap distance between drum and the rotary magnetic and static heads. To maintain concentricity, solid metal shims had to be machined to very close tolerances. Any drum warpage after machining causes trouble.

• Floating Heads—LRI has applied the

Ballou effect by designing the magnetic heads to float as a function of an 0.0004-in. thick air gap. As the drum rotates, the floating heads come into contact with the drum. Using the floating head technique, data can be read at 100 ft/sec, read head speed, or 100 times faster than with a fixed head, yet noise less than 5% variation in signal level, company says.

Alwac's built-in test circuitry has simplified trouble-shooting, although LRI has sufficient confidence in the machine's inherent reliability to guarantee it for one year against failures resulting from normal usage. The original purchase price includes scheduled maintenance service by LRI for a year, the company says.

New Devices to Aid Servo System Design

A variety of new devices which may aid servo system designers in getting smaller, more reliable or lighter response systems, has been announced recently. The devices are:

• Bridge connectors. Full-wave bridge enterprise, for use as a modulator, modulator, as chopper, over the frequency range of 0 to 3,000 cps, with conversion frequency of 855 cps, has linearity of 1% of full scale, according to manufacturer. Device has an average weight of 1.5 oz. and is 1 in. x 3 in. x 1 in. weight of 2 oz. and is designed for operation between -50°C and 100°C. Maximum input voltage is 100 v, and maximum output voltage is 120 v and with a dc output of 50 v when used as a chopper. Sodertel Automatics, Inc., Nutley, N. J.

• Motor motor. Minimum 1/32 hp, 6,000 rpm dc motor designed for use in a continuous line in the car in guided missile. Motor is 11 in. in diameter x 23 in. long. John Ochs Mfg. Co., Racine, Wis.

• Voltage references. Constant reference voltage, capable of maintaining reference voltage of 3 to 400 cps, for use in solid-state and hybrid circuits, has been developed by Microelectronics-Honeywell's Automatic Devices and will be used in company's own computers. Designated the GGI510A, one pin, device employs word programming to accomplish rates of 100 microseconds to 100 microseconds. It has small total deflection in address state sampling. Unit can be provided with one or two potentiometer potentiometers, and unbalanced switch if required for vertical gate selection. M.H. says device needs 500E-512L can be provided with my required sampling rate between 0.2 and 1.0.

• Inductance probe. The D-2, and series of four elements (array of four are used in the C), Company adds that it is seeking "sponsorship" for the construction of a (Uniscomp-D) machine.



High G-Rate Gyro

Sensitive rate gyro, capable of measuring angular rates up to 3 to 400 deg/sec, and withstands high G loads, has been developed by Microelectronics-Honeywell's Automatic Devices and will be used in company's own computers. Designated the GGI510A, one pin, device employs word programming to accomplish rates of 100 microseconds to 100 microseconds. It has small total deflection in address state sampling. Unit can be provided with one or two potentiometer potentiometers, and unbalanced switch if required for vertical gate selection. M.H. says device needs 500E-512L can be provided with my required sampling rate between 0.2 and 1.0.

• Inductance probe. The D-2, and series of four elements (array of four are used in the C), Company adds that it is seeking "sponsorship" for the construction of a (Uniscomp-D) machine.

shaft torque is 0.03 in.-in., no load speed is 5,000 rpm, according to manufacturer. When each generator is connected from 115 v, it delivers output of 0.5 watts/1,000 rpm, has cell voltage of 19 v. Output impedance is 600 ohms. Microdyne Corp., Research Park, Inc., 1150 McBride Ave., Little Falls, N. J.

• Frequency multiplier. Magnetic frequency multiplier, designed to convert 400-cps, 3-phase power into 2,000-cps, single-phase power, has a conversion



efficiency of 75%, according to manufacturer. Model F-10 delivers 5 with conversion frequency of 855 cps, has linearity of 1% of full scale, according to manufacturer. Device has an average weight of 1.5 oz. and is 1 in. x 3 in. x 1 in. weight of 2 oz. and is designed for operation between -50°C and 100°C. Maximum input voltage is 100 v, and maximum output voltage is 120 v and with a dc output of 50 v when used as a chopper. Sodertel Automatics, Inc., Nutley, N. J.

• Rectangular. Miniature, improved Series V1, is available with 7, 8, 14, 16, 20, 21, 25, or 40 contacts, as a 25-contact unit with a single high voltage contact. Polarizing pads and bonds are optional. Viking Electric, 1461 1/2 Gothic St., Los Angeles, Calif.

• Circular. 3/8-in. diameter, 12 contacts, rectangular, with a rectangular or rectangular shield, moisture resistance and exterior insulation, is first of its type to be approved under MIL-C-5015, according to its manufacturer, Sodertel Magnetics Division of Beale Aviation. Sodertel says moisture-proofing is accomplished without use of potting compounds. Address Sodertel, N. Y.

• Single-pin probe. Series 371, 3/16 in. dia., for use in bringing out a single connection, such as an test point, is available in any one of three different molding compounds, Jones Defense Annex, 45-00 Northern Blvd., Long Island City 1, N. Y. Functionally similar probe, model 37, is a high-current probe, designed for a high-current test point in power 500-watt components rating 100 v, with a current rating of over 1,000 v, is available from M. W. Bellinger Co., Chemical Metal Dev., P.O. Box 461, Jersey City 3, N. J.

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New Avionics Testers For Production Line

A robot tester, designed to automatically scan through a series of tests on a piece of electronic equipment, sounding an alarm when it finds a fault, is one of three recently announced devices suitable for production-line testing of avionic equipment or devices. The other two are:

- **Autovector product tester**, capable of performing up to 400 individual automatically sequenced tests, including continuity, voltage, resistance, amplitude, gain, phase, relationships, an frequency response, at the rate of several checks per second. Device processes through sequence of tests, skipping and retesting when results fall outside allowable limits. Called the "Step-tester," device can be quickly changed to test different products by plugging in different patch boards. Superiorities is manufactured by Cole Telemetry Inc., 911 San Carlos Ave., San Carlos, Calif.

- **Expanded scale voltmeter**, for displaying waveforms, waveforms ratio of transmission, operation and modulation, having power and/or secondary voltage ranges of 57 to 115 V. Accuracy is 0.1% of input voltage, input impedance is 10,000 ohms/volt. Manufacturer is Argus Div., Beckman Instruments Inc., 230 Franklin Ave., South Pasadena, Calif.

- **Khrysma tube checker**, designed to test all commercially available kly-



seen from external RF measuring equipment. Manufacturer is Poland Aero-Instrum Corp., 100 Metropolitan Ave., Brooklyn 11, N. Y.

TEST CENTER

• **Digital Computer Oscilloscope**—Hughes Aircraft is expected to take off some of the costs now inherent in the use of analog scopes by using digital computers as plotters in aircraft designs can be found at Design-Aircraft. The price of the scope, which has 500 ft of trace space devoted to displaying waveform, today is competitive, occupying 12,000 sq. ft.

• **GE G-45 Precision Tube Price**—Price reductions averaging 20% have been announced by General Electric on 25 of its 32 high reliability Five Star types of vacuum tubes. More is intended to boost commercial use of tubes originally developed for atomic and military systems.

• **Avionics Bibliography**—Recently announced publication of interest to persons in the avionics field include the following:

- **Militec**, for aircraft and defense use, including application engineering data, is described at GEC-588, prepared by General Electric Co., Schenectady, N. Y.

- **Micromechanics Handbook**, for design, analysis and construction of micro and miniaturized components in precision avionic and computing computers, is described in Catalog Sheet 1040, available from Edimacronics, 1807 Flamingo Rd., Cleveland, Ohio.

- **Ultrasonic Sensors**—A catalog of 16 pages, at a variety of sizes and shapes, are described and application engineering data is given in a new 50-page catalog prepared by Standard Ceramic & Manufacturing Co., Los Angeles, Calif.

- **Relay Catalog**, No. 122, describes a variety of relays, including 400 cyclic a.c. relay, magnetic reed, point contact, and super sensitive types, is available from Pulex & Braudel, Passaic, Ind.

- **Electronics equipment**, including transistors, logic, amplifiers, capacitors, filters and test equipment, is described in a 100-page catalog from Washington Electric Corp., Box 2050, Pittsburgh 18, Pa.

- **Electronics panels and components**, featuring 1000 part type catalog, is described as Bulletin TM 942, available from the company, 301 Morris Ave., New York 16, N. Y.

- **Electronics test techniques for use with cathode-ray tubes** are described in a new 16-page manual available from the Technical Sales Dept., Allen B. DuMont Laboratories, Inc., Clifton, N. J.

mon type tube which operates and can be excited at altitudes up to 80,000 ft. New tube, designed to replace conventional 6X4 or the 6X4W, is factory tested under vibration for 40 hours.

► **Stereoschreiber, Inc.**, Equipe-Servosystems Inc., producer of servo systems and controls, has recently acquired wholly owned subcontractor, Industrial Electronics of Canada Ltd., Toronto. In addition to its ongoing line of electronic test equipment and training devices, the Canadian company will produce Saxonian's own designed servo systems and components.

► **Growing Computer Role**—Evidence of the fast-growing role which analog and digital computers are playing in aircraft designs can be found at Design-Aircraft. The price of the scope, which has 500 ft of trace space devoted to displaying waveform, today is competitive, occupying 12,000 sq. ft.

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► **Long-Playing Records**
New SoundMaster Corp. tape recorder will operate up to 40 hours continuously and unattended, making it useful for recording annual general shareholders' Company reports the Aerovox Radio, Inc., a unit

of the recorders at its Valley Stream, N. Y. station. Device was originally developed under contract to New York Stock of Ships, SoundMaster's address New Haven, Conn.

three of the recorders at its Valley Stream, N. Y. station. Device was originally developed under contract to New York Stock of Ships, SoundMaster's address New Haven, Conn.

FINANCIAL

1953 Market Fluctuations of Leading Aircraft Companies

Company	1952 Earnings		1953 Earnings		Increase (Decrease)	Percent Increase (Decrease)
	1952 Mkt. Val.	1952 Sales	1953 Mkt. Val.	1953 Sales		
Bell	\$104	\$—	\$111	\$102	\$600	52.7%
Boeing	\$20,000	\$1,250	\$21,200	\$1,250	\$1,200	9.8%
Cessna	\$1,000	\$100	\$105	\$85	\$75	7.8%
Convair	\$104	\$1,000	\$105	\$1,000	\$1	0.1%
Douglas	\$104	\$7,000	\$115	\$7,000	\$11,000	10.4%
Embraer	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Fairchild	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Fiat	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Fokker	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
General	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Grumman	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Lockheed	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
MacDonnell	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
McDonnell	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
North American	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Northrop	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Rockwell	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
Sperry	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%
United	\$104	\$1,000	\$115	\$1,000	\$11,000	10.4%

ing of regular quarterly dividends (Aviation Week, Nov. 9, p. 70) as well as losses in the decline.

Convair, which gained 18.2% during 1952, gave most of this up last year with a net loss of 16%.

This also was the case with Grumman Aircraft Engineering Corp., which showed a price increase of 9.5% during 1952 but declined 6.2% in 1953.

Curtiss-Wright Corp. showed declining market valuations for the second year, falling 15.2% in 1953's year end after the 5.3% depreciation in market value reported in its October 1952 earnings.

► **Stock Price Appraisals**—A significant feature of the group shown is separate aircraft equity shares during 1953 is shown with one exception. Northwest, they say a continuation of some last year's price appraisals established during 1952 and earlier.

However, the same stock price given for 1952 were not present last year, nor were the price signs reported for all companies. For one thing, as higher price plateaus are reached by individual aircraft equities, it becomes increasingly difficult to negotiate valuations given of the same stock.

To some, the percentage market appreciation in year each year would seem the underlying coverage would have to move by the same percentage each year. Or, as the general market places a higher valuation on aircraft earnings, it is possible that the equities may continue relatively higher earnings since—that attaining higher levels through this process.

► **Shares**—Greatest percentage appraisals were recorded by Northwest Aircraft, Inc., up 38.1%. This may have been accounted for in view of the stock's high level of appreciation in 1952 for this reason. Northwest was one of two aircraft stocks that declined during the year, while up 10.7% during the end of 1952.

During 1953, by a slight increase and showing a significant price gain of 13.3% was Fairchild Engine & Airplane Corp. This follows a gain of 7.7% the previous year. Westinghouse Aircraft Corp. was the only aircraft company to show a loss for 1953, with a price appraisement of 3.7% compared with a gain of 5.5% in the end of 1952, for example.

► **Market Share**—The aircraft group market share, 1952-1953, was 10.4% for 1953, and 10.7% for 1952. This is the result of the 17 leading aircraft leaders. Price appraisals for 1953 were 10.7% for the 1952 year end.

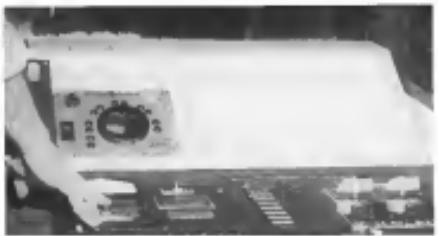
► **Dividend Perpetuation**—Wide dispersion of 1953 aircraft stock fluctuations clearly should demonstrate however that not all companies will participate uniformly in the possible benefits and earnings. To last there is no assurance all companies will operate profitably.

Solvently and carefully individual eval-



Long-Playing Records

New SoundMaster Corp. tape recorder will operate up to 40 hours continuously and unattended, making it useful for recording annual general shareholders' Company reports the Aerovox Radio, Inc., a unit



SWITCH PANEL controls runway lights at Stapleton Field, Denver.

Denver Gets Bright Light System

A powerful new lighting system capable of 100 miles away has been installed along the 10,000 ft east-west runway at Denver's Stapleton Field.

Tell Holmes, chief controller of the Civil Aviation Administration tower at the municipal airport, says the lights "will prove virtually any weather flight, enabling planes to land safely under all weather conditions."

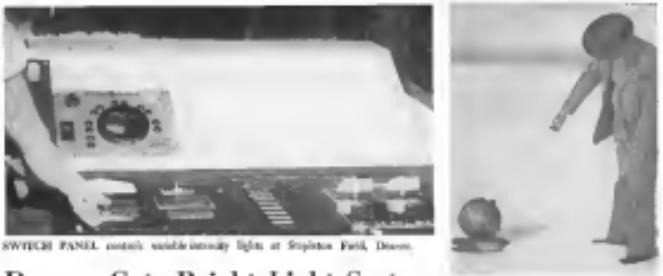
The new lights can be taken from the tower instantly to their highest brightness in 10 to 12 seconds. They remain at that level for as long as necessary, according to Robert Weeks of Denver's engineering staff, who designed and supervised the installation.

The lights are as continuously as they get brighter or dimmer, increasing the flying safety factor. Under the old system at Stapleton, the lights would go out automatically as they were heightened to darkness. Furthermore, standard airport lighting consists of the following type, permitting 1, 3, 10, 30 or 60 lights to be turned on at a time.

But at their head, to be installed at one airport, the lights were developed and manufactured by Erie Metal Co., a division of McCay Electric Co., Milwaukee, Wis. CAA paid approximately \$60,000 of the total cost of the \$70,000 project.

► Bidirectional—These are bidirectional controllable beam lights. The 500 watt lamps produce a maximum of 200,000 lumens per lamp per light. There are 35 of the lights, approximately 200 ft apart along each side of the runway.

Along the first 1,500 ft east and of the runway, the lights are half-circle to indicate end of the runway to the pilot, landing or taking off.



HIGH INTENSITY light can go from 900 to 100,000 lumens in 7 ms.

Position of the lighting in the event of failure, Weeks says.

If the primary feature should default, the runway can be placed back in service within a half hour by closing and opening the proper oil contacts. The secondary rate of the transformation can be used.

► Intensity On Demand—The tower operator turns the lights at the intensity required by the pilot as he looks or turns or

flies or. (For a pilot's convenience on the path of quick communication with the tower, Capt. Robert's words, in story above.)

A 50-kva induction voltage regulator was installed on the main transformer itself in the airport administration building. It receives 2,300 v and feeds it to 12 60-volt (5 kva) transformers in the field. Each transformer feeds from 9 to 10 lights.

The standard circuit breaker is 17 ms of cable. Cable is buried, except under roads or the runway where it is raised to 10 ft. The voltage is 120 v.

► Voltage suppressed open lights from the field transformer regulate the dc current of the lights. The bulk rate on two preprint sockets attached to the armature is a thermal and compensated thermometer. The voltage is suppressed across the 16-ohm element, causing the light to move in a 7.5-degree arc and having the beam is a 15-degree arc. But low current is used.

The thermometer compensates for the increase or decrease of the ambient temperature within the light housing to give true control at all times.

► Strobe Runway Lighting system of three of four counts at each of the 12 field transformers permits quick re-

Pilots on Lights

Aircraft exterior lighting and airport illumination recently got a going over by the man who uses it the most—the airline pilot. Committees of opinion. There is considerable room for improvement.

The pilot views were given recently before the Committee on Aviation Lighting of the Illuminating Engineering Society (November 1951, p. 189) by United Air Lines Capt. Robert A. Stone and American Airlines Capt. R. C. Robins. Both were meeting officials for the Air Line Pilots Assn.

Aircraft Lighting

The highlights of Capt. Stone's paper, "An Airline Pilot Sees Aircraft Lighting," follow:

► Rotating Lights—There are two types



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Revere control instruments have shared the responsibility and achievements of the aircraft industry since 1939 with years of dependable performance under all types of weather conditions. Today Revere is recognized as one of the foremost producers of precision instruments. You'll find them installed in many world-famous airplanes...

Extensive research and development facilities coupled with precise production methods contribute immensely to Revere's reputation for highest quality control instruments. Contact Revere's field engineering department today. Let qualified engineers assist you with your liquid or electromechanical control problems...

FLAME RETARDANT

Recently developed by Revere for use in aircraft, the Revere Flame Retardant is used in the McDonnell F2H-2 Interceptor night fighter. This flame retardant prevents a burning signal whenever fuel flow fails below a pre-determined level. Send for Bulletin No. 1400.



FUEL FLOW TRANSMITTER

The Revere Fuel Flow Transmitter is used in the Republic F-84 Thunderjet. It measures the rate of fuel flow in the 18-1300 jet engines. The flow transmitter can be used as pressure transmitters, absolute or differential pressure transmitters. Send for Bulletin No. 1400.



GASOLINE LEVEL SWITCH

Revere's 9-1400 Threshold and 9-1500 Gasoline-Threshold are used in most air force Revere's digital level switches installed in their fuel tanks. They measure gasoline, immediately indicating when propane is near depletion. Send for Bulletin No. 1400.



ROTARY SWITCH

Revere's 9-1400 Switches have Revere Fuel switches installed in all field units to indicate fuel level. These switches can be mounted with single or dual fuel systems with levels set at the bottom. Send for Bulletin No. 1400.



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North American has built more airplanes than any other company in the world.



GRIMES light: 99 mm on a 90° angle.

of exterior lights on an aircraft—those which illuminate the exterior of plane and those which make it conspicuous to other pilots.

First type of light illuminate wing leading edges to alert an aircraft during approach or severe wing conditions. These "wing lights" are usually solid beam units on the sides of the fuselage or wings. They have power limitation, according to Stone, except that "all too frequently the light is not located in the right place and the leading edges are not." There are a number of possible locations for the lights to be located to illuminate the top of the wing rather than the leading edge in order to provide light for greater safety in serving the airplane.

Stone suggests that approach lights be provided for the ground crew. Outside illumination is also used to three light on.

• **Exterior needles** to check for oil leaks and vibrations. Proper observation of

the latter is important in establishing a correct analysis of any trouble which may exist. Stone suggests that it might be possible to develop a light which would simultaneously illuminate leading edges, top surfaces of wings and needles.

• **Leading gear** to check if it is properly extended. It also helps to check the condition to make sure nose has blown out. Stone points out, many planes now flying have small spot lights in the wheel wells. But all aircraft are not so equipped.

• **Reversing** leading lights which are mounted from the underside of the wing (the most prevalent type) have a serious shortcoming, they cannot be located at high angles. Stone says the motion which causes them cannot drive the lights out against a heavy air load, retarding the pilot from wing load, to observe weather ahead unless he reduces speed to leading velocities also, pilots like to turn on leading lights to serve as identification when approaching large airports at night.

Stone has noted that with high-speed aircraft, the leading edge of the wing extends and the other does not, the resulting aerodynamic forces may move the plane to roll violently.

Other drawbacks with current leading lights caused by Stone are their tendency towards balance when used in nose down or nose up. This balance tends to blind a pilot flying low to have lights off until he is practically in the runway.

When turning at night pilots often want to see one side of the nose or the other to locate turner, but leading lights show freely ahead during turns and are of no use in this regard. • **Identifying**—Leading identification lights on the outside of the airplane should serve these three purposes, in this order of importance, says Stone:

- **Pilot purpose** of the lights is to let other pilots know where you quickly, positively and at sufficient distance to avoid unnecessarily violent evasive maneuvers. A leading red light does this best, according to Stone. The light can serve continuously to identify the light and the red color is desirable because it is traditional danger signal. Moreover, when flying through clouds the red reflection is less disturbing than white.

The leading light should be so placed on the aircraft that it is visible from as many angles as possible. The top of the vertical fin seems to fill this requirement best. Also, by being mounted well above the pilot's normal line of vision, it does not tend to blind him.

Stone notes that the heat and collision light ALPA has seen so far is one made by the Cramer Manufacturing Co. (AVIATION Week, April 8, 1958, p. 24). The light, which consists of a bulb

shining vertically on a "V" sloped, so that incandescent is being installed as vertical for top by several sources, among them United Air Lines and American Airlines. Relation of warm incandescent light appear to fact as it passes observer's eyes. Stone adds: "The entire mechanism is enclosed in a transparent red cover and it is interesting to note that the absorption of light by the red cover makes it still stronger when it becomes quite warm when in use." Stone reports that the light has frequently been seen at ranges of 40 mi and at least twice as far as 60 mi with a very clear night. This same range is of course more than the speed of aircraft (and therefore the speed at which they close) continues to increase.

• **Secondary function** of exterior lights is to tell the other fellow what you are doing, the U.S. Army caption states.

Caution aircraft, he says, mount a "Clinton light" array of lighting red and green wings, light alternating with white lights on the fuselage and concentrated with alternating red and white tail lights. Stone, says Stone, does this because from sailing vessels he adds that the "Clinton" would have been the best to use.

Stone has noted that the Clinton array is 100 watts DC-12, and is very inadequate for the 500 watts plus transports of today. Speed of flashing is being increased

from 60 to 80 cycles per minute. This helps, but still leaves much to be desired, according to Stone. Alan Robbie, he says, is that our set of lights is enough to do two jobs, make the plane conspicuous and detect its course and altitude. One improvement in these lights on which pilots are in unanimous agreement, says the airline pilot, is that they must be brighter. The increase in brightness is dictated not only by speed increase. Another factor making the more important is that the beginning of the incandescent light than the wing tip lights to the pilot's eyes. So, the wing tip lights are to be strengthened, he says, to prevent the other fellow from the other plane a closing, they have to be brighter.

• **Oil leak** importance in the identification of the type of accident the airline pilot is looking at, according to Stone. "Just a lot of window dressing," he says. But it would be handy to know if it could be seen easily.

Stone gave a pat on the back to the Civil Aviation Administration's Technical Development and Evaluation Center at Indianapolis where much of the coordination work in improving aircraft lighting has been done. Stone has said, "These people have been instrumental in providing better lighting and new light and continuing light tests and conferences aimed at improving lighting."



ATA-ALPA CENTERLINE approach lighting system—the so-called "configuration A"—is seen in a big step forward toward safety and more landing of aircraft.

Airport Lighting

Capt. Robert's paper was entitled "Caption ALPA Point of View on Runway and Taxway Lighting." Highlights from his presentation follows:

• **Runway + Taxway Lighting.**—Capt. Robert's point of view is that runway and taxiway lights are good, good lights. However, runway and taxiway lights are not good enough to make an airplane take off and land. They have to be good, good lights.

• **Approach lights.**—Capt. Robert's point of view is that the heat and collision light ALPA has seen so far is one made by the Cramer Manufacturing Co. (AVIATION Week, April 8, 1958, p. 24). The light, which consists of a bulb

shining vertically on a "V" sloped, so that incandescent is being installed as vertical for top by several sources, among them United Air Lines and American Airlines. Relation of warm incandescent light appear to fact as it passes observer's eyes. Stone adds: "The entire mechanism is enclosed in a transparent red cover and it is interesting to note that the absorption of light by the red cover makes it still stronger when it becomes quite warm when in use." Stone reports that the light has frequently been seen at ranges of 40 mi and at least twice as far as 60 mi with a very clear night. This same range is of course more than the speed of aircraft (and therefore the speed at which they close) continues to increase.

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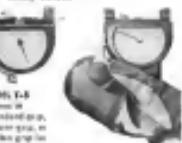
Read Control Cable Tension...in Pounds, with the New T-60

STURGESS TENSIMETER

MONI ACCURACY with many new improvements developed through 33 years tensiometer experience, supplemented by suggestions of representatives of the aircraft industry. Many to read and indicates accurate tension directly in pounds. New design prevents damage to cable when reading tension. Large 16 mm face is 100% clear for accurate reading.

MAINTENANCE ... the new T-60 is serviceable for use on both primary and secondary control cables. Tension from 16 lbs to 100 lbs. Over-tension can cause damage to the instrument.

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American aircraft manufacturers today had more aircraft than ever before, though impossible just a few years ago. A large part of their success has been due to the inclusion of more and better electronic equipment in each new model. But, the use of this additional equipment has created new problems for aircraft manufacturers, particularly those of space and weight.

One answer to these difficulties is the miniaturization of electronic equipment, and working on the components for this have been the engineers' assignment. From the beginning, aircraft have evolved many of the same basic components and principles as other electronic equipment, particularly in television, communications, instrumentation, connectors and cables. In our compact electronic assemblies, we have helped solve many of the problems created by the need toward miniaturization.

Amphenol is the world's largest single source manufacturer of aircraft and aerospace, R&P, connectors and cable. At your service to assist you with applications of these components is the Amphenol Engineering Consulting Service, who will also work with you in the modification of Amphenol components or the design of totally new units to your specifications.

AMPHENOL

AMERICAN PRECISION CORPORATION, Volume 56, January

the individual light's beam.

Robson is against variable focus. He thinks the complexities and possibility of failure to operate just when it is most needed, militate against variable focus lights. Pick a good, low-loss lamp, mount it and stick to it, he advises.

On the other hand, he strongly supports automatically variable intensity lights. To be of real value, the lights must be automatically variable, but how to accomplish this is a puzzle, Robson admits, more, as he says, "To assume that an automated system will always be a 'dead channel' at the very instant when the pilot wants the light dimmed is... expecting the impossible." Instead, he suggests that it would be more logical to establish separate, feed light control mechanisms for day and night operations.

► **Hiding the Trouble**—Robson points out the problem a pilot has in finding his way around large, poorly lighted air ports at night. He even knows ways to navigate and not clearly, doesn't see well "key" to the pilot—he wants more on the active runway, slowing up planes waiting 50 feet behind him. A pilot wants an unbreakable light combination which will have clearly white the turnoffs are several hundred to a thousand feet before he gets them. And it should be remembered that he is running up to 100 mph., and is easily engaged in reversing gear, flying along at 100 mph., and so on, changing banks, keeping the plane head up with the nose, watching right plan several other things.

► **Stay on Track**—Next problem is to stay on the runway, which can be difficult if it is not properly lighted. Robson speaks深知 all pilot's fears: reactions to pilots who drive planes off runways into the inevitable soft mud.

Two suggestions to help keep pilots on tracks:

- Brighter blue lights speed pilot's eye adaptation.
- Continuous painted in yellow to designate the runway center stripe from white stripes on runways.

Finally, Robson pleads for large, highly placed, movable, painted direction signs, black lettering on a shiny white background. Signs should be large for easy reading. Signs placed to be easily seen from high altitudes, now able to accommodate problems of more rugged, site, and painted instead of electrically lighted because painted signs are simple and require no extra wiring.

Electric signs mean more strain on the aircraft's electrical system and since there are more electrical and expensive to repair than electrical signs than painted signs for the same amount of money, says Robson. Painted signs last longer and stick to high temperatures than do electronic signs.



AMPHENOL flexible duct connector values EMI problems in Constitution supersonic fighter duct.

Non-Metal Connector Solves Duct Problem

Amphenol Rubber Co. reports it has solved a serious maintenance problem for F-105 Thunderchief aircraft by using a new non-metallic high-temperature duct coupler.

Eastern reported frequent failure of the flexible metal bellows mounted in rectangular inlet ducts of their Constitution aircraft, due to fatigue induced by vibration and impact motions.

Although silicone fiber glass mats of this type were not approved by the Civil Aviation Administration for such installations, Amphenol developed a new coupling, fabricated of multiple plies of a silicone rubber impregnated fiber glass fabric which the firm calls Amphi.

► **CAA Approval**—These couplings are currently without CAA use but are currently now being approved by the CAA for use in the Constitution. The test was passed by the Lockheed engineering mechanical research department test group.

Amphenol Rubber Co. believes that a duct matrice of a silicone fiber glass fabric duct connector being so approved by the CAA for use in a low pressure and low-temperature part acceptable for use in fire areas 1, 2, and 3 in all aircraft engine applications.

The company says the couplings also withstand extreme low temperatures and retain their flexibility down to minus 125°F.

It appears at this time that this type of silicone fiber glass flexible coupling offers up many new design possibilities of interest to aircraft engineers for applications where flexible coupling subjected to high temperatures have and extreme low temperatures are

WHY USE QUICK-COUPLING CONNECTORS FOR THERMOCOUPLE CIRCUITS?

TO SAVE TIME!

Splicing making and breaking of thermocouple circuits can take a lot of costly time. However, if you use T-8 quick-coupling connectors, a circuit can be made or quickly and easily as plugging in a radio.

Electrical contact is established through polished elements which are made of Thermocouple materials (your choice for use will vary: Constantine, Copper Constantan or Chromel-Alumel Thermocouple). To maintain good electrical contact, the two polished parts provide both longitudinal and transverse spring loaded contacts. The connectors have screw terminals, insulated copper, colored and marked to indicate calibrations.

Interested? Write for Bulletin 23-C.

WHY USE CONNECTOR PANELS FOR MULTIPLE THERMOCOUPLE CIRCUITS?

TO SAVE TIME!

By connecting all thermocouple circuits through central points, such as through T-8 connector panels, you can save time in 2 ways:

- 1) Check instruments or thermocouple circuits from one or more centrally located distribution panels. With plug-and-play connectors, test equipment is easily and quickly tapped into any circuit (2 frontends, single thermocouple circuit).
- 2) Centralized connecting connectors permit rapid testing and breaking of instruments and "couple circuits," eliminate splicing time and avoid re-wiring problems. Panel illustrated takes 12 thermometers, 36 thermocouples. Bigger or smaller panels, if you want 'em.

Interested? Write for Bulletin 23-C.

Pyrometers • Thermocouples • Pressure Transducers • Quick-Coupling Connectors • Thermocouple and Reference Wires • Reference Bulbs • Connector Panels

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Valve Talk

for WM. R. WHITAKER CO., Ltd.

by Morris Miles,

Senior Member, Aviation Writers Assn.



The new Douglas DC-7 is labeled the "world's fastest propeller driven transport" and it's easy to believe when you see New York's Idlewild runways beneath you just six hours and thirty-eight minutes out of Los Angeles—nonstop.

The margin of difference between the standard DC-6B and the "Seven," of course, is the Wright R-3350 Turbo-Compound engine developing 3250 horsepower on takeoff to give the new Douglas ship a total of 13,000 horsepower, a cruising speed of 365 m.p.h. (50 m.p.h. faster than the DC-6B) and a top of 4100.

The company is operating the first two aircraft nonstop between the States, over a long haul, to be faster than Britain's fastest jet Comet.

To the flight from London to Johannesburg, South Africa, for instance. In the first place, the Comet made by way of Rome, Cairo, Khartoum and Port Sudan, took approximately 662 miles (by current schedule), whereas a static analysis made for South African Airways put 220 miles on the Varsity route. The record was set by way of Johannesburg, Khartoum and Nairobi—a several hundred miles less.

The staff points out the advantage of using a long-range aircraft that is not compelled to make numerous refueling stops at short range. Comet.

The company figures that that flight of 1617 miles to Comiso 1000 ft. from London in 5 hours, the British will match at 4000 ft. (1000 ft. above sea level). The speed of the Comet won't knock down world 20,000 ft. ST distance lists.

The company figures that that flight of 1617 miles to Rome, 1000 ft. from London, will knock off an average flight speed of 220 m.p.h., the DC-7 will cruise at 360 m.p.h. (100 m.p.h. faster than the Douglas) and at 320 m.p.h., yet beat the 700 m.p.h. transatlantic by 30 minutes by virtue of lower fuel consumption per mile and half the time.

The plane is remarkable, but when you add into the comparison the fact that the Comet 7 carries only 38 passengers, while the Douglas carries 44, plus 1000 ft. of passenger luggage space and 60 for the freight section (only 16 minutes slower than the transatlantic when the latter rated about 2000 ft. faster), Douglas has come up with a terrific combination.

And if you want to an even economy, compare the Comet's direct operating cost of 1.25 cents per mile for 4 seats for the London-Johannesburg run with 0.26 cents for the Douglas' DC-7 and 1.79 cents for the 40-passenger version.

"It's a lot of money, but there we get 6 seats in a lot of airplane, too,"

concluded and, where coupling are required in locations in aircraft engine compartments where CAA approved for instant and fingered methods are a requirement," the company reports.

After withstandng 2,000-lb. thrust forces for 15 sec., the coupling under test was found not vibrated violently and permanent set was increased from 15 to 17 degrees with load.

The coupling also was tested under simulated operating conditions with an airflow of 30 lb. per sec. of 150°F at 15 deg. Further tests of a more severe condition, where the 2,000-lb. force was applied with an instant low or positive, showed the parts to withstand the fast load even when there was an instant airflow to conduct heat away from the outer surface of the casings.

Cost is Low—Averaging just over the new coupling is much lower than that of flexible metal bellows type connectors, which are used in many applications. Other advantages will include lightweight construction, negligible air flow at almost any degree of vibration required and stability to shock vibration and vibration during and torque motions.

Installation is simple, the company says, with no special tools required. The part usually is installed by means of standard snap type hose clamp. Types are available which withstand pressures as high as 150 ps and over 1000° F.

Can American Airlines be far behind on the Comet's wake, for the most recent, through chairman C. R. Smith, has asked Dan D. Hodder, Director of Engineering, Dan Hodder, Chief of Diagnostic Operations, and others helped bring the DC-7 into existence with the same speed and efficiency shown in the case of the Comet.

If you take off at night in this special super-speed transport there's immediate, accurate and startling improvement in the darkened cockpit. Continuous images of blue-white instrument frames to understand at first the vast ground presented within the dark frame.

In daylight flight the same frame is seen, but the spring tensioned display becomes more and more more accurate as the sky is filled with more power in it seeking that matching cockpit organization over the vast landscape. You become familiar quickly with the new cockpit and the instrument panel.

There are seven commanding features about the DC-7, such as: greater reliability, simpler air conditioning, more comfortable seats, better handling, utilization of the landing gear as a special break, dualized, square-shaped cockpit, and record economy. The DC-7 will be the first airplane to pass 4000 ft. of altitude in 140,000 ft. flight miles. But there's no intention to mention on detail.

Whatever happens, Douglas is in the lead, and the Douglas DC-7 is the first airplane to pass 4000 ft. of altitude in 140,000 ft. flight miles. The company also commends American Airlines for its part in the project.

An air safety official said that the Douglas' record is the result of a long history of improving the flying record of American Airlines.

"It's a lot of money, but there we get 6 seats in a lot of airplane, too,"

Two power ports are provided—an

electrical pack for general ventilation and a centralized pack to be used if electrical power is unavailable.

These sizes of film magazines are provided: The 100 ft. capacity is the most commonly used and is the only one which fits the 0.28 in. slot. Other magazines are available in 200 ft. and 400 ft.

► **Operating Features**—Other features of the Inset 0.30 system are:

• **Lights**—for aircraft illumination. • Power is normally supplied by an electrical motor spring storage unit. This insures constant air speed even when the power source is lost.

• **String holder**—of the common use of a gauze design to withstand high accelerations and high-amplitude vibration experienced in strict combat.

The 0.30 system was developed through joint research by the Bofors Corp., 11815 E. 23rd St., New York, and the Air Force's Aerospace and Development Command.



New Camera System For Radar Records

A new camera system, featuring a high degree of unit interchangeability, to photograph television images in various modes of operation, has been developed by the Bofors Corporation of America. The system, named the Bofors 0-36, replaces the now obsolete 0-35 camera system, according to the manufacturer. It operates with 35 mm. film.

► **Major Components**—It is made up of these five units:

- Type 0-36: Data recording
- Type 0-36: Motion speed (data recording recording)
- Type 0-39: Low speed (data recording recording)
- Type 0-10: Radar scope image recording
- Type 0-32: Radar scope image-optical bridge

Each unit is made up of three basic parts: body, power pack and film magazine. Power pack and film magazine are electrical. Bodies differ but have many interchangeable parts and assemblies to simplify maintenance and spare parts stocking.

Two power ports are provided—an

Safe Simplifies NAL Ticket Cash Handling

One of the Major Safe Co. Cash G. Valve safe series (National Safety 180 series) recently installed at New York Pan Am Sub-Airline Terminal Hotel counter, the safe company announced. Now, each of the 11 agents at the counter keeps his change fund in his own individualized safe deposit compartment, 30 of which are arranged in the upper half of the specially designed safe. Each box is designed to hold \$50 in coins and bills.

The boxes are easily accessible through the transparent plastic box which is used to speed counting. It is easy to replace a box in the safe, an easily seen and locked again the next time.

Cash and bills of each day's receipts are put in a special counter map per carrying an annual statement of

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the cash receipts. These are deposited in a special slot whence the money drops into a locked depository in the lower part of the safe. Each agent now requires about 10 min. to count and turn in his cash at the end of a shift instead of the 30 min. formerly required. And he uses the small cash box instead of a three-by-two-foot cash drawer.

Automatic Selector Announces Flights

Denver flight department and arrivals at the Municipal Airport here are automated automatically over a selector system similar to that on plane buses.

The selector buses are installed at each of the nine gate-area stations. Load-operated in the terminal and the exterior wings carry the announcements. Ticket agents can break into the net work at any time and make emergency announcements.

Each of the 600 airline—Contractor Charter, Executive, Wharfed and Royal—has been allotted enough of the 100-100 combinations to meet its needs.

OFF THE LINE

New York Air Brake Co. has opened sales and service facilities on the West Coast equipped to handle hydraulic and vacuum pumps made by NYAB's Kansas and Wisconsin divisions. The business has increased so rapidly in demand that new units are now made by the company. Hydrovac's Wisconsin plant will be responsible to run out of California. Statoil's new hydraulic pumps, a small, representative stock of most of the two divisions' pumps will be carried for samples and test installations. The West Coast branch, at 3035 Vinson Blvd., Los Angeles, Calif., will cover California, Oregon, Washington, Arizona, Nevada and Utah.

American AirTech is asking a nationwide evaluation of Hawker Tool and Engineering Co.'s Model 2000 air filter, the company reports. United Air Lines has recommended the filter for use in pressurization (Aerospace Wire, June 8, p. 96). The Model-2000 units are made of duPont acrylic resin fiber sheets of filter net of meshweight below 3,400-A. Hawker's offices, 1915 Smith Bendy Dr., Los Angeles 25, Calif.

Transocean Trading Co. has been appointed exclusive agent for Japan Aviation Maintenance Co., the former firm announces. Covered under the agreement are products used in aircraft overhaul imported from the U.S. and imported into Japan.

NEW AVIATION PRODUCTS

Synthetic Hose Resists New Jet Engine Oil

Plastic hose made from fluorocarbon resins, which is said to be capable of handling newly-developed synthetic oils used in the design of jet engines, is being marketed by Rotolastic Corp., Bellville, N.J.

Company experts have been put through rugged tests to prove its capability to handle such oils under severe jet engine operating conditions. It is found that the oils were developed in much of the future of conventional petroleum hydrocarbons to stand up under the extreme temperatures encountered at jet aircraft operation.

They are said to provide the standard lubricating qualities in addition to having low viscosity at low temperatures and good condition stability at high temperatures.

The firm points out that ordinary fuel-oiling materials are not able to stand up under the high temperatures reached by these synthetic lubricants. This plus the common factor necessitated development of a leak-free accompanying the necessary physical and chemical oil properties.

Rotolastic Corp., Bellville, N.J.

'Muffs' Protect Ears From Jet Engine Noise

New ear guards for protection against noise corrosion to air traffic controllers and other high-decibel noise professions has been developed by David Clark Co., subsidiary of Massachusetts, Inc.

Unit is made in two sizes, one for inside and one for outside use and a "Dong" (ear) type for continuous and variable use. Company says sound protector cups are made of a combination of closed-cell polyethylene and sound-deadening plastics that filter out protection from both low and high frequency noise.

Chief features claimed for straightaway sound protectors are completely washable, extremely non-toxic, washable, comfortable for long periods of wear, designed for use with all types of safety gloves and hard hats. All units carry one-year guarantee.

David Clark Co., Inc., 350 Park Ave., Worcester 2, Mass.

Stewardess Folding Seat Simple to Install

A new model of stewardess seat, interchangeable with the Douglas standard two DC-10 stewardess seat, has been



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SALARY COMMENSURATE WITH QUALIFICATIONS

WHO'S WHERE

(Continued from page 11)

Changes

Charles A. Garner has become chief engineer of Aero-Console's Air Traffic Division.

Horst Frey is new manager of quality control at Marquette Aircraft Corp., Vero Beach, Calif. Also promoted: Roy Schonbeck, assistant chief inspector; Joseph Koenig, special assistant to the chief inspector; and Edna Wissik, manager of quality control.

Gilbert Delaney has resigned as flight test engineer in Civil Aerodynamics Administration's Region 1 to join DeVos Engineering Service at New York, specializing in a civil helicopter certification consultant.

Joseph N. Rausche, Jr., has been appointed manager of the new Research and Development Division of Pan American World Airways' Latin American Division. Thomas F. Sengpiel is new member of PAA's legal staff.

W. W. White has been promoted to staff supervisor of future planning at United Air Lines' special liaison to Denver.

William J. O'Brien has been manager of Ford Motor Co.'s Aerostatic Project Directorate at Chicago, succeeding W. W. Wodzinski, who has been promoted to industrial relations manager of the Steel Division at Dearborn, Mich.

William Bunting is new publicity director for the U.S. Steel Corp., New York.

Ira W. Borchard has been advanced to manager of steels products sales for Vicks Inc., Detroit.

Wilkes Elster has become purchasing manager of Republic Aviation Corp., Farmingdale, N.Y. He succeeds John J. O'Farrell, who now is manager of all Republic Corp. apprentices. Wesley Frys, agent in charge of the purchasing section, Vicksburg, has been promoted manager.

John B. Neupauer has joined Transocean Aircraft Corp., Dallas, as manager of the new aircraft division.

Charles D. Adams has resigned as chief of advertising and public relations for Duncan Helicopters Corp., Encino, Calif., will continue with the company in a part-time consultant.

Mark D. Dabbs, longtime staff member of Lockheed Aircraft Co.'s Central Missile Division, is now sales manager for Marquette Research Corp., El Segundo, Calif.

Ronald H. Caines, former controller for CAL's finance of Air Operations, has been appointed manager for Scheme B flight division on the 11th floor.

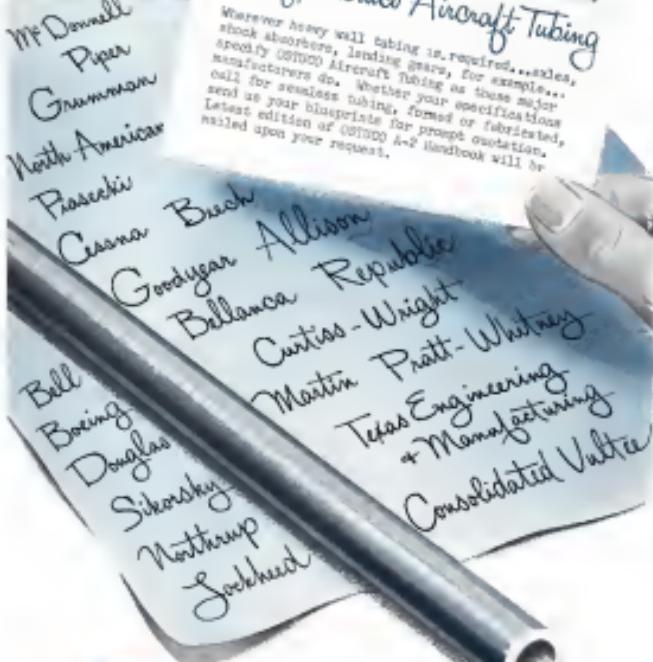
Edwin L. Bryson has been appointed assistant manager and Frank R. Boley, Jr., is new chief engineer of Allstate Aviation Service Co., Los Angeles. Howard F. Wood has resigned as assistant chief engineer to set up a mechanical engineering consulting practice.

Winston R. Bay has been named sales manager of the British Overseas Airways Corp. E. H. Timsek Thompson has been appointed manager, North America.

Raymond R. Sheet has become manager sales manager for Central Airlines.

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br. for planes with adequate space and still be exploited over surface transportation.

► **Industry Capacity**—Assuming no extraordinary increase in traffic volume either of passengers or cargo, ATA estimates that equipment now in or due there should be ample capacity in Army use to absorb diverted commercial mail and mail-in use if surcharge is eliminated.

That leaves the capacity of the industry as a whole. ATA emphasizes. On the second point concerning the ability of individual carriers, ATA points out that capacity to carry an increased load of mail will not be found uniformly among the carriers.

Capacity of the large carriers is also questioned, and ATA holds that it usually would be a matter of scheduling as far as local service and small regional operators are concerned, and that will easily involuntarily can be planned, particularly with employment of motor carrier operations as supplements when necessary.

► **Backing Upgrades**—Based on the conclusions arrived at from the study, ATA recommends that the airfield authorities give full support to an expedited mail program based on the flat fee-rate set for a single-point postal rate. These are the considerations the transport association puts forth in support of its recommendations.

► **Implementation of both a system in 1954 or 1955 appears reasonable**: The Citizens Committee probably will recommend a surface-to-air program, either with the present airmail operation or a new one. It would appear that a carrier has more to gain through actual sponsorship than other private acceptance or acceptance.

► **The present Administration is both** mail and transportation-conscious. Unless the industry backs a positive program at the start, it is likely that the Post Office will continue to develop the program as an experimental basis. If this is done, a close relationship between airmail rates and mail may ultimately have to be "discovered" and revised.

► **Support for such a program is strongly** urged. Since it may be in the future, carrying as it does from Post Office, certain legal and even mail and airmail postal personnel.

► **Additional estimated revenue of \$55 million** probable is a minimum. It is based on CAB-determined service rates. It may be better to addify on industry rate or rate revision now rather than wait until lower rates for all airmail mail are set through Post Office Department pressure.

► **General economic circumstances and the continuing readjustments for defense costs** to one way or the other in reshaping the industry decisions.

ATA's Johnson Is Airlift Booster

Carriers can play a major role in giving wings to the fast soldier, transport association head tells Aviation Week.

Earl Dalton Johnson, who takes over today as president of the Air Transport Association, is a longtime crusader for military transport. Johnson's personal experience with military mail extends over 23 years and includes:

- Geological prospecting by air over the Canadian Arctic.
- More than 5,000 hr of logged military flight time in 40 different types of aircraft.

- Worldwide service during ascent over most of the uninhabited regions that are now standard airline routes.

- Three-year campaign as a top-level test civilian to increase the striking power of the ground forces by adapting them to mobile mobility and supply.

- Each year in a flying team with an airfield engineer straight to the point of what he wants to explain.

- "Our problem is the Army," he told AVIATION WEEK in an exclusive interview, "to develop an airborne mobility for the ground forces that will give them the speed and punch of a horse who can beat his opponent three times for every blow it takes. Only properly organized airfields will enable us to use our numerically inferior military teams successfully against an enemy with a tremendous superiority in manpower."

- **Cpt. Wallace**—"We will always need good airmen," he said. "I think the Army has a natural inclination at this point. Somebody will always have to walk all the way—will be changed so that there won't have to walk all the way."

- The problem of giving the ground Army wings is two-fold, according to Johnson. First, despite its effort to be available to move the Army and its equipment. It is fairly obvious that the military can't afford to maintain all of that airfield within its own organization as it does now, and it can't afford to have it taken over by the civilian airfields as it was during World War II.

- Johnson cited the record of the industry in transporting 25 million people during 1953, compared with 13 million carried on military parole and flying cars as an indication of how far transportation has had because an integral part of the American economy.

- Johnson believes that the problem of providing enough surplus airfield in civilian air transport usage is one of the big unsolved problems facing the aviation industry and the Defense Department.
- **New Equipment**—Second, the Army's equipment must be made air transportable. An understanding of the Army,



Earl Johnson

Johnson's responsibilities included both procurement and research and development of the ground forces that will give them the speed and punch of a horse who can beat his opponent three times for every blow it takes. Only properly organized airfields will enable us to use our numerically inferior military teams successfully against an enemy with a tremendous superiority in manpower.

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► **New Equipment**—Second, the Army's equipment must be made air transportable. An understanding of the Army,

Opposite: Keflavik airfield against the Caucasus in 1953. Flying at low altitude over one of the roughest terrain in the world it was here breaking to see the caucasian lines of fast-suited tracks in the snow bouldering that remains today.

Looking down we could see the tracks snaking 2000' apart, meandering in their regularity going up one track ridge, down the other and so on the next, the next and the next. If ever a construction was strengthened, we would get the Army to add to it.

► **Exploring Canadian Arctic**—Johnson first became interested in aviation in 1925 while serving as number chief of a geological exploring expedition to the Canadian Arctic regions that now provide much of the uranium mined on this continent.

After graduating from the University of Wisconsin in 1925 as a 1st Lt. in the Air Corps, Johnson stayed on as a graduate instructor and research assistant in geology and took an apprenticeship to the Canadian expedition during the summer between school years.

The expedition employed two Five-child plane-load of scientific equipment to move the scientific party from base to hundreds of miles of barren rock formations that would have taken months to explore on the surface. From the experience Johnson got his first view of the earth from the air and his conviction in the utility of the airplane in the modern world.

► **An Army Cadet**—When the investment business he joined after leaving the university dissolved during the Depression, Johnson applied for flight training in 1932 as an Air Corps cadet and was accepted for the first class to use the new training center at Randolph Field, Texas.

► **The Army**—This Johnson was most of the time who ran the field and learned to fly with most of the men who will say it is the new James Cag Van der Zee was an incentive for Johnson's class. Lt. Gen. William Tamm, former chief pilot and now commander of U.S. Air Forces in Europe, had a brother next to Johnson in flight operations. Most of Johnson's classmate who remained in the Air Force are now senior generals.

► **Air Transport**—Following with pilot's wings from the Air Corps, Johnson lighter than the F-11, he became a member of the D-12, he participated in tests for its results before being made head of active duty because the Air Corps lacked funds to maintain its pilot strength.

► **White Aviation Test**—He returned to the maintenance business in Milwaukee but kept a hot reserve flying his cargo plane even though it meant driving a 240-mi roundtrip every weekend from his home as a member of the Milwaukee

league to the airport on the north side of Chicago.

During these years he flew anything the Air Corps had available, including Boeing B-17 heavy fighters, B-25 and D-19 observation planes and early model transports. When the engine pilot training program began, he was drafted by the University of Wisconsin Extension Division as Milwaukee to instruct and teach its first class.

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league and the Chicago terminals at Chicago.

Johnson says one of the secrets of the association that made some round trips between Milwaukee and Asia in 1948 was the combining of all the old Air Corps master sergeants he had known during his early service days and assigning them to ride the Far East planes to take over route checks to handle route maintenance.

Johnson left the Air Transport Command in March 1948 as a colonel and senior pilot and returned to the insurance business in New York. He returned to active duty in 1948 to assist in the merger of ATC and MATS and again in 1949 when he served with the Continental Division of MATS in Alaska.

He was appointed Assistant Secretary of the Army in 1950 by President Truman, presented to Undersecretary in 1952 and reinstated as Undersecretary by President Eisenhower in February 1953. —3011

U.S. Exports 17% Of Avgas Production

Approximately 17% of U.S. aviation gasoline produced in 1953 was exported, Secretary of Commerce Sinclair Weeks reported.

Avgas and blending agents for its production from the oil and petroleum products still under export control because of short supply by any U.S. needs and world defense posture caused all imports in this line to be subject to close scrutiny.

Imports in the third quarter of last year totaled 3,468,000 barrels, compared with 2,268,000 for the previous quarter.



JAL Previews Trans-Pacific Service

Coast of Japan Air Lines has now status listed as the Far East for an eight-day tour of Japan, the Far East, and Australia. The tour was Robert W. Morris, Jr., Aviation Week publisher. JAL is scheduled to start trans-Pacific DC-6 Pacific service Feb. 8.

DC-7 Flights Running Overtime

American Airlines has been running an average of about 45 min overtime on its scheduled eight-hour morning DC-7 New York to Los Angeles flights during the first two months of operation.

Only one outbound flight is reported to have made the run on schedule. The Los Angeles-New York half of the route has been running on time.

► **Violation.**—Air Lines Pilots Association spokesman says American's use of one hour in excess of eight hours in violation of Civil Air Regulations, which limit carry-on flight hours to a 24-hour period.

It would appear, he says, that the carrier's schedule is thus one in violation.

It has been indicated that ALPA will take steps with AA to correct the situation, and, if unsuccessful, then with Civil Aeronautics Ad-

ministration to cause the company to comply with federal regulations. ► **All.** Vietnamese holds that the eight-hour schedule is based on a five-year weather study and that average flight time will run under eight hours over the course of a year.

The airline points out that at the most difficult time of year because of the strong prevailing westerly winds.

CAA rejects it as "fallacious of the problem and is watching it carefully."

If ALPA does bring about action, American would be faced with:

- Penalties of having to discontinue service.
- Asking a CAB waiver to permit use of multiple crews on DC-7s.
- Gearing up winter would permit other airlines to do the same, however, and American would lose its competitive cost-cutting advantage.

of the application which the carrier wished to keep confidential and is to file the application.

Chairman announced that such application would be taken up at the Board meeting the following morning. Application was filed at 8:51 a.m. Jan. 21. Board convened eight minutes later and approved American's request for exemption by a vote of 10 to two and adjourned at 9:40 a.m.

Regarding the statement that the Board has no jurisdiction, the President, Los Angeles Section 801 of the air that operates Board authority in case of certifications involving revenue and foreign air transportation is subject to approval of the President.

► **Rights of Hearing.**—Leroy is the majority's action violates the rights of other and hearing.

"This is not the first time the Board has been asked to amend these statutory requirements which up to now forth in both the Civil Aeronautics and Administrative Procedure Act," the CAB member says.

"But this is the first time the Board has ever yielded to such a request either through written document or oral application."

"I am in complete disagreement with the majority's statement that American's pack request is in an emergency where American has had an file with CAB since Aug. 29, 1947, in application to consolidate its routes so that it can operate nonstop service between New York and Mexico City. This status has been pending nearly seven years and the Board could have at any time set this matter down for hearing."

The majority's statement that "such action is without prejudice to the rights of other carriers" is erroneous in the writer's opinion, as much else. However, American has been granted certain nonstop service to Mexico City as ultimate in the same temporary manner "without prejudice to others" less.

Art, curtails the President and denies other carrier due process of law—all for the purpose of protecting the monopoly of American Airlines to Mexico City.

"The action of the majority is appropriate giving weight to a new route for American. . . . But I have noted through my journals that I have not been given time to prepare a dissenting opinion. The Board must realize that the route they are trying first due to my attention in the Board meetings is now Joe 10. When the chairman presented American's petition with a covering letter which requested confidential treatment:

"At a special meeting . . . the Board denied American's request for review and restricted the examiner to return the petition to the carrier and advise American's attorney to delete pertinent

information to existing rights of other American carriers consisting for a New York-Mexico City route.

The majority notes the exemption is

Copter Air Bus

- LAA chief tells cities to plan now for copters.
- He warns against rules that would stifle growth.

Low Angeles-Claire Belton, president of Los Angeles Airways, has told Southern California city planners they must pursue now for the arrival of a "new dimension in transportation"—the helicopter.

Belton says transportation officials must discuss the idea that the helicopter is an airplane. "It confuses the aviation of the airplane, bus, truck and automobile."

► **Exploding Potentials.**—The LAA executive spoke at a forum sponsored jointly by the American Helicopter Society, the Southern California Planning Council and the Los Angeles Chamber of Commerce.

It was the first community-wide effort to explore the possibilities of the copter and the effect its transportation pattern might have on the Southern California future.

Speakers of the meeting hope it will be the first step toward an organization for intra-state copter planning, similar to the helicopter section of the Port of New York Authority.

► **Protected Air Space.**—Belton warns against pressurizing a "whole series of rules and regulations" in other order to a third of environment can the concept of the copter. The world's first recorded of helicopters is in Indiana.

He urges local leaders to plan for helicopter that would haveavigable air space protected against encroachment of any kind.

"Each city, town or hamlet can afford to include in its planning a 200 ft. by 200 ft. by one of the helicopter-parking, a plot of grass," Belton says.

► **Forge Service.**—The LAA outlined that pattern of "use bus service," which he predicts will be in operation by the early 1960s.

► **Small towns will be "bus stops."** as Belton says.

► **Helicopters will require a landing site close to the center of town with large parking areas for interchanges of passengers possible in a shopping center.**

He estimates 10% of the population of the U.S. is located in helicopter range.

► **Transport Centers.**—Belton predicts the heliport might move into a transport center similar to the old-line milkman station.

He reports that LA Airways already

has

located in Southern California routes that pursue as going out to the



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CAB Okays AA Service to Mexico

Approval still is needed from Mexican government for nonstop flights from N. Y.; Eastern fights Board action.

American Airlines, aided by a resolution from the State Department, has won Civil Aeronautics Board permission to start nonstop nonstop service between New York and Mexico City.

But the service still must be approved by Mexico before the carrier can begin competing with nonstop Constitution Air Lines, managed by Air France two weeks ago in the same route (Aviation Week, Jan. 25, p. 7).

Eastern Air Lines, supported by CAB's action, has filed a report for a stopover route on the nonstop with U. S. Court of Appeals in the District of Columbia. CAB and American have agreed to participate in the stopover service until Feb. 8.

► **97% of Capacity.**—Meanwhile, American has increased its coast-to-coast nonstop DC-7 service, starting nonstop flights on the New York-Los Angeles route and with an originating New York San Francisco.

AA vice president William J. Flynn reports perhabs on the DC-7 flights have averaged 90% of capacity since the service began late in November (AVIATION WEEK, Nov. 30, p. 15).

► **Competitive Position.**—On American's petition for an intra-city Mexico City-New York service, CAB approved the flights in a three-to-two decision based on the "particular circumstances involved."

The majority notes the exemption is



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Columbus, Ohio, Columbus 2-1991
Dallas, Texas, Dallas 4-1212
Denver, Colo., Denver 3-1222
Detroit, Mich., Detroit 2-1222
Fresno, Calif., Fresno 2-5444
Honolulu, Hawaii, Honolulu 2-1212
Houston, Tex., Houston 2-1111
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brilliant in "watch the numbers go through"—much as they showed up at the depth in former years to good the evening train.

► Doing a job—Continued—All mail came from Southern California by the return during 1953 was handled on Los Angeles Airports, as president asserts. On the last day of 1953, LAA, San (43,812).

"Any device capable of doing a job such as this right now deserves consideration by any passenger," Bellon says. He urges those not to put themselves in the position of the economist who predicted in 1932 that we would be between New York and Washington never would be a financial success because of the time it would take over that route.

► Adaptable Service—The helicopter "air bus" can connect the pilot with refueling fields for jet transports, thereby eliminating the problem of jet operation over any area, Bellon points out.

But it does not serve only the airlines. It is equally adaptable to the task of taking passengers from outlying districts to the railroad system, he notes.

Bellon says LA Airways will begin at least twice passenger service before mid-1954, but claims it is "absolutely necessary" to have multi-engine helicopter flights beginning operation over extended areas.

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Slick Pilots Hit ALPA 'Politics' in Merger

Los Angeles—L. W. Cassidy, then man of the Slick Airline Pilots Assoc., accused Air Line Pilots Assoc. last week of "using pressure and power politics" in the recently dispute that threatened to delay the merger of Flying Tigers and Slick.

Flying Tigers pilots are members of ALPA. "ALPA is reluctant to sign the agreement until it is sure of being the bargaining agent for the Flying Tigers," Cassidy said. "At the Slick pilots went on a far break for convenience."

► Agreement—Both Flying-Tigers and Slicks seek of meetings between the pilot groups failed to have an agreement on the question of how members would be compensated. Further meetings were rescheduled for mid-week in Chicago.

Slick pilots have asked Civil Aeronautics Board to review the labor agreement in merger decision. "If necessary," Cassidy said, "we will take the case to court."

CAB had ruled no dispute over pay scale should be settled by negotiations between the respective members but if negotiations fail, the whole issue is up.

► Necessary Steps—Is regard to the pilot dispute over members a spokesman for the Flying-Tigers said: "We believe that all we have to do is to file CAB and we have taken the necessary steps on the labor clauses and have recommended that our remaining pilots in despite go to arbitration, as requested by the Board. Our responsibility ends there."

Whether CAB will accept this is an other question.

The Flying-Tigers official admitted that over seven months, threatened by Slick pilots could delay the merger.

**Control Loss Seen
In PAL Rome Crash**

(McGraw-Hill World News)

Rome—Loss of pilot control at low altitude caused the crash of a Pan American Airways DC-6 plane at 17,000 feet after it had passed the final approach point, the Italian news sheet (Aviation Wire Jan. 25, p. 7), a PAL report indicates. The information was forwarded to the airline following an official investigation.

PAL's delegate also reports the DC-6 reached Ciampino Airport only two minutes before the crash that the flight was proceeding normally.

Entombed in the crash are the plane's left outboard engine was running smoothly and was smoking when the transport's nose suddenly dipped and crashed into the ground.



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FEATURE PAGE

Strictly Personal

If any airline is offering a more luxurious service than Air France, it has not come to my attention. This winter was one of a group of magazine, newspaper, television, and movie people invited by Air France to help open the once weekly Golden Phoenix flights between New York and Paris on a Convair Constellation equipped with section's newest to the stampeding rhinoceros. Lounges were dry, by day, at night, with excellent food, comfortable seats, comfortable and pleasant staff, and a wide range of services service for us conference people. It was a contrast to our recent all-night DC-4 coach trip in the same. There is a place for money in air transportation, so long as there isn't any more of it than will pay its own way.

Air France flew its VIP party between Paris and Algiers by Comet. It is operating there, and we flew in two of them. We could check widely circulated reports about the Super Comet's vibration and the Comet's lack of it. We were surprised how much floor vibration there is on the Comet (hocker rug would help), because most very good British publicity had conveyed the impression that there won't and except for a narrow ship, should not be. So we went in armed to try an experiment, with the conclusion, Robert Matisse, a well-known aviation writer.

As a result, we decided the Comet has no monopoly on smooth flying, despite the name which should cover something on edge in the pilot's compartment of that fine ship. The accompanying picture was taken aboard the Super Comet, over the Atlantic, westbound.

The crew acted reportedly, from one to two to four minutes, and still not because of vibration but from very slight altitude changes due to an overcast. We have Ma Matisse's letter referring to the "canceled" experiment. "It's a pity," wrote, "that the flight from Paris to Algiers had to stand on the edge of a Comet. A 5-minute transatlantic cross of the French Republic stood on edge (no edge a man will fly) on a table in the lounge of Air France's Golden Phoenix Super Constellation, as well as on a table on the Comet." Nevertheless, it is fair to say that the Comet is a little quiter inside its cabin than conventional transports, as the others on Air France's staff who have Comets will attest—Robert Matisse, Jr., Publisher, and George Chastan, Executive Editor.

Signs on the door of the AIA office in Washington which housed publicity GRHQ for the 50th anniversary of powered flight "Out Back in 50 years?" CAA continues to look isolated now. Is the last to come? We are not told these questions have reached solutions. Blameless, Nader, Black Field, and Gandy. Pastushin, Pastushin, Pastushin.

Personal costs are reflected in CAA's International Division. The Alexander McNeely Memorial Fund now exceeds \$2,000. Contributions in memory of the former aeronautic editor of Aviation Week to help complete the education of his three children—she will be sent to May Gertrude McNeely, 4628 N. Carver Spring Rd., Arlington, Va. ... One of the U.S. magazines that has newspaper headlines less with its stories about Ritzian planes was caught briefly by the London Daily Sketch for publishing a photo about Hitler's V-1s. When questioned by the Associated Press, the American editor and the original article had been only "an educated guess." Fortunately, Aviation Week had been offered the same very earlier, and had rejected it.

AVIATION CALENDAR

Feb. 1-5—American Society for Testing Materials, 1954 Committee Week, with symposium on polar of transposed radio and design of experiments. Sheraton Hotel, Washington.

Feb. 1-2—21st Anniversary of Sustained Flight—celebrated by Link Aviation, Inc., Milwaukee, Wisconsin, N.Y.

Feb. 5—Society of Paints Industry, ninth annual division conference on reinforced plastics. Edgewater Beach Hotel, Chicago.

Feb. 4—Institutional Society of America ninth annual regional conference, Hotel New York.

Feb. 4-8—Amesron Radio Inc., general session of Airlines Electronic Research Association (joined to manufacture) Hotel Statler, Washington, D. C.

Feb. 10-12—American Institute of Electrical Engineers, 1954 Annual Convention, Ambassador Hotel, Los Angeles.

Feb. 15-19—Monogram Aviation Trade Association, Boston.

Feb. 15-18—Institute of Radio Engineers and American Institute of Electrical Engineers, 1954 Annual Convention, Philadelphia.

Feb. 20-23—Third annual Texas Agricultural Aviation Conference, Texas A&M College, College Station, Tex.

Feb. 22-23—Seventh annual National Model Plane Show, Cleveland, organized by Air Pavilion, Inc., Cleveland Chapter of Commodity Showmen, Hough Co. auditorium, Cleveland.

Feb. 24-26—Ohio-Indiana Agricultural Aviation Conference, Ohio State University, Mt. Sci. & Technology, Columbus, Dayton Hotel, Washington, D. C.

Mar. 22-25—Institute of Radio Engineers national convention, Willow Run Armory and Kingsbridge Annex, New York.

Apr. 1-2—National Park Service, Convention Hall, Atlantic City, N. J.

Apr. 14-15—Society for Experimental Stress Analysis, spring meeting, Netherlands Park Hotel, Cincinnati.

Apr. 19-21—Society of Broadcast Engineers, annual meeting of stations' equipment, directed jointly by Standard Research Institute and USAR, Pastushin Hotel, San Francisco.

Apr. 23-24—annual student paper competition for undergraduate and graduate students, organized by the Texas section of IAS, Mission Hotel, Dallas.

Apr. 23-25—joint meeting of Radio Technical Committee for Aeronautics, Franklin Institute Laboratories, Institute of the Aerospace Sciences, and National Association of Radio Engineers (Philadelphia Section), Philadelphia.

Apr. 23-27—American Institute of Electrical Engineers, conference on feedback control, Glendale Hotel, Atlantic City, N. J.

May 1-2—Electron Components Symposium, sponsored by Interior association, Washington, D. C.

May 5-9—Third International Aviation Trade Show, managed by Avionics Trade Shows, Inc., The Regent, New York.

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ARMSTRONG-SPARRELL & WILSON INC.
AIRCRAFT ENGINEERS

Trends in Airmail Pay

The Post Office Department, imbued with an attorney and drove not one but five cars on those so-called lists, has taken drastic steps affecting airmail in the 13 months of the Eisenhower Administration. In its campaign for economy, it is definitely countering a specific play on Civil Aeronautics Board, an AVIATION WEEK analysis shows, which now starts another squeeze on the airmail services. The real impact on the airlines is yet to come.

Recent Postmaster adjustments in the airmail rate structure have been tooth-taking to the transport industry observers accustomed to a good deal of the past 20 years—except for a brief period when Carl Bellamy, an American Postmaster General, imposed freighter mail carriage for metropolitan communities.

Only a few weeks ago the Post Office decided to turn over mail volume, effective June 1, to the carrier with the lowest competitive rate. This started an unprecedented stampede by air mail carriers, formerly on a 5-cent-per-mile rate, who wound up requesting and being granted a basic rate of 45 cents, matching the "Big Four."

But there is no question as to the P.O.'s determination to cut the "service" rates paid the airlines. As a result of Reorganization Plan No. 18, effective on last Oct. 1, all subsidy payments to the airlines now come out of the CAB budget with the P.O. paying only the designated "service" rates. This change does not disqualify air certificated mail carriers from subsidy payments as long as proper acid can be shown. Accordingly, if an airline increases on a higher "service" rate but drops to a lower "service" level because compelled in its operations, it may become more dependent for subsidy support from CAB. That may reduce the P.O. budget much but it may increase the Board's.

For that reason, the Board may begin to limit further diminution of the mail rate structure, in the opinion of some observers.

Presided by Senate Interstate and Foreign Commerce Committee, the Board more than two years ago made a courageous attempt to separate subsidy from service mail payments for all of the individual airlines. Based on a major study, the domestic lines were grouped into seven classes to determine appropriate class service rates. The compensation service rates varied from 45 cents per mile for the "Big Four" group up to \$7.26 per ton mile for the local service group.

Significantly, the basic 45-cent rate was declared by the Board to be premised on scientific and detailed data following a comprehensive survey as to the "cost of mail service and costing techniques." A rate thus computed was said to be devoid of subsidy and gradually myriad as the lowest mail compensation would possibly reach.

Nevertheless, some Franklin questioned CAB's determination, maintaining that 45 cents was too low. Recent Post Office action, however, seems to have placed the Board's previously well-defined service and subsidy classification of the airlines in a doubtful position, one financial authority believes. Major revisions appear likely and may stem from the current study of the entire airmail pay structure ordered by the Board.

While the rates may be clarified somewhat by this inquiry, it is felt by those who are best informed on the subject that few conclusive results will be forthcoming immediately.

Another significant test may develop soon in a series of the "experience" in flying all first-class mail between Chicago and New York, and Chicago-Washington. This service, being flown by United, TWA, American and Capital, takes a much lower rate, 18.66 cents a ton-mile between New York-Chicago, and 20.04 cents between Washington-Chicago. Since Oct. 6, when the P.O. to the participating airlines in this non-preferential service was accepted, all the mail offered by the P.O. to the participating airlines in this non-preferential service was accepted and never diverted to the mills.

So there has been adequate space available to handle that volume. Through the end of December the four lines carried about 2,004 tons of mail for about \$146,000.

So far, it appears most of the participants in the operation are pleased. The four airlines view these added revenues as gravy, since little added expense has been incurred.

Some air transport officials, however, fear the P.O. may utilize results of the experiment to reduce the "regular" rate of 45 cents a ton-mile being paid the carriers for preferential airmail. Any reduction in this rate will, of course, further cut the P.O.'s budget needs.

Not satisfied by any means in the role, if any, to be played by the all-cargo lines in carrying mail. None of them holds authorization from CAB to transport mail. The P.O., however, might envy of these carriers to assist in the "experience" in carry surface and by air.

In an interesting 52 decision, the Board on Dec. 3 held that it could authorize all cargo and non-airmail carriers to fly mail through exemption from regulation. This brought an immediate threat from American and TWA that if that ruling were placed in effect, a court stay would be sought immediately so as to prevent the exemption device in stock instances would be as illegal as possible. Let us then wish well to the Board (and to all of us) as it goes to work to see that there are no need at this time for the participation of uncertified terminal carriers in the movement of first-class and surface mail in order to ensure the success of the Post Office experiment.

The P.O. presumably would welcome the capacity available through the all-cargo lines to carry first-class mail. It would also represent a competitive pressure to drop mail compensation even lower.

"The 45-cent minimum may now be in some jeopardy," one observer writes. "All airlines will feel the effect of any adjustments that are made in the basic 45-cent rate. Should reductions be imposed below that level, it may be necessary for corresponding cuts to be made for the entire range of carriers."

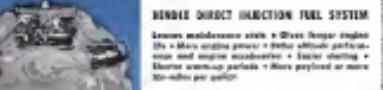
Curiously, mail compensation is a small percentage of total revenues of most of the tank airlines. Except for Birlif, Northwest, Continental and Colgan, mail revenues are of little relative significance. But if airline earnings should turn downward, however, mail revenues could once more assume their former significance for a number of the usaged carriers in providing deficit operations.

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